Railway Age Gazette

Including the Railroad Gazette and The Railway Age

Published Every Friday, and Daily Eight Times in June, by
THE RAILROAD GAZETTE (Inc.), 83 Fulton St., New York.

CHICAGO: Plymouth Bldg. CLEVELAND: Williamson Bldg.
LONDON: Queen Anne's Chambers, Westminster.

W. H. Boardman, *President.*
E. A. Simmons, *Vice-Pres. & Treas.* Henry Lee, *Secretary.*
The address of the company is the address of the officers.

EDITORS:

W. H. Boardman, *Editor.*	Roy V. Wright	B. B. Adams
Samuel O. Dunn, *Western Edit. Mgr.*	G. L. Fowler	W. E. Hooper
	William Forsyth	F. E. Lister
Bradford Boardman, *Eastern Edit. Mgr.*	S. W. Dunning	F. W. Kraeger
	Clarence Deming	H. H. Simmons

Subscriptions, including regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico..... $5.00 a year.
Canada..... $6.00 a year.
Foreign Edition (London).....£1 12*s.* ($8.00) a year.
Single Copies.....15 cents each.

Shop Edition and the eight M. M. and M. C. B. Convention Daily issues, United States and Mexico, $1.50; Canada, $2.00; Foreign, $3.00.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

Volume 49. Friday, October 28, 1910. Number 18.

CONTENTS

EDITORIAL:

Editorial Notes 771
Ideal and Actual Paint Practice 772
Divided Responsibility for Railway Management 772
Northern Pacific 773, 822
Baltimore & Ohio 775, 815
Chicago, Rock Island & Pacific 776, 818
New Books 778

ILLUSTRATED:

Marvin Hughitt 783
William A. Gardner 784
Bridge and Building Convention 786
Pacific Type Locomotive: Central of Brazil 795
Double Track Railways in Georgia and Florida 797

MISCELLANEOUS:

Railway Capital and Capitalization 778
Train Accidents in September 795
Transportation and Traffic in Austria-Hungary 797
Unloading Coal with Ballast Spreader 799
Foreign Railway Notes 785, 796

GENERAL NEWS SECTION 800

SUPPLY TRADE SECTION 813

A FEW weeks ago at an up-country flag station a number of would-be passengers awaited a train at the scheduled hour and minute. The regular signal was given, but the train ran by without stop and those in waiting were forced to walk some miles to their destination at the terminal of the branch line—or wait three hours for the next train. There was, of course, natural and just wrath, but only one of the irate parties took up the idea of reporting to the railway company. On his asking for names of the others to confirm his testimony, *not one* of them would assent. They "didn't want trouble"; they tamed down into the conviction that "it wouldn't happen again," and one of the gentler sex, with some show of feminine asperity, answered that "she wasn't a suffragette." But the single man went ahead. He communicated the facts to the division superintendent, who made prompt investigation, found the train and engine crew at fault, notified the complainant that severe disciplinary measures would be taken and, in behalf of the company, gave him thanks; while, presumptively, those who walked and did not write took it out in abuse of the corporation. The incident illustrates the proneness to abuse rather than make formal complaint; the inertness of the passenger who would rather have things pleasant for himself than right for everybody; and his ignorance of the real desire of the railway manager to detect through the public the misdoing which only through the public's co-operation can be detected. And, in another direction, it is quite possible that the episode symbolizes and illustrates the results of that dependence on the union, in place of loyalty to the corporation, which the author of "Confessions of a Railway Signalman" has so forcibly put in print.

THE contributions of British railways to benevolent objects (not including their own employees) as reported to the Board of Trade amounted in 1909 to $82,411, about half of the total going to hospitals, infirmaries and dispensaries. The summary names 27 objects, ranging from the Welsh National Pageant to the International Railway Congress. Schools and technical institutes got $4,815, including $1,000 from each of several roads for the London School of Economics. At Crewe, where the London & North Western, in a sense, owns the city, the curate of Christ Church received from that railway $875. Other roads contributed considerable sums to churches. The South Western gave $25 to the London Cart Horse Parade Society. The Great Southern & Western of Ireland contributed small sums to Killarney church, to the Newbridge Nursing Fund, to the Dungarvan Band, the Cork City Regatta and to fifty other objects, including races, presumably horse races, at 22 different places. The races at Curragh, Cork and Punchestown got $500 each. We regret that we cannot favor the reader with any American statistics with which to compare these expenditures. Professor Adams has been working at Washington now for over four years in a strenuous endeavor to make the railways tell all things that ever they did; but we have not noticed that he has published, as yet, anything concerning contributions to horse races. However, American railway managers will not fail to notice, and, we trust, emulate, the impartiality of the G. S. & W. in treating the 22 suppliants all alike. Probably Professor Adams' search of the railways' books will not reveal much material of this kind, anyway. All of the big roads have dried up the fountains of their generosity—and the small ones haven't any. Even if he should go back to the time when Mr. Harriman saved the country with his $50,000 check, the Union Pacific's books might not show the item.

IS railway transportation a commodity or a service? is a question which the layman can view from various angles. Thus transportation is the product of invested funds turned into a great material machine—the railway—operated by a sub-machine—the locomotive; and the analogy thus becomes, in a sense, complete between the railway and the factory that turns out, by its investment, its building and its machinery, a product which everybody concedes to be a commodity or, to use a synonym, "goods." In the same way a somewhat similar analogy can be traced between transportation and the commodity which the merchant sells. He has his money invested in goods, his mechanism (plant) of store and counter and his operating force of clerks. On the other hand, there is the different final analysis which makes transportation a service and demarcates it from a commodity because a service, directly, at least, and as popularly understood, is not the product of a mechanism; and hence comes the derived idea of the public service relation of the individual to transportation as based on a civic right, of his railway ticket as a kind of tax receipt, of his right to uniformity of fares and freight rates and of the railway's deprivation of the freedom of private contract when it sells its service. When we move a step further and ask what the attitude of the government should

be, can anyone point out the vital principle. The government may look on transportation as a free commodity or as a service under restrictions based on political rights, but it cannot do both. It may make transportation flesh or fowl, but it cannot make it a hybrid. Yet that is just what the government is doing, or rather trying to do. It calls, under one line of policy and law-making, for the competition of railways, which, right on its face, means competitive rates and discrimination of rates; under another line of policy it calls for uniformity of rates and non-discrimination. It assails as a "conspiracy" an agreement on rates, while at the same time it assails railway rivalry as involving unjust discrimination. These are facts to bear in mind when important decisions of the United States Supreme Court are not far away. Will that final tribunal clarify both its earlier decisions and elucidate the federal policy, or shall we have a new maze of inconsistencies hung up somewhere midway between the theorems of "commodity" and "service"?

IDEAL AND ACTUAL PAINT PRACTICE.

IN a paper read before the New York Railroad Club, last week, William Marshall gave a very thorough and exhaustive review of the conditions necessary for securing the best possible results in the protection of iron and steel against rust. The reading of the paper was followed by an equally comprehensive discussion. As a record of the best current practice it was apparently all that could be desired, but when the last analysis is made it will be found that there was little or nothing in it of real novelty, and in this lies the reason for these comments. From time immemorial engineers and all who have had to do with the protection of iron and steel have urged that a proper cleansing of the surface of the metal before the application of the paint is an absolute necessity, or at any rate the best possible means of insuring good results, the sand blast being the best known means of cleansing them. Then must come the careful application of the coating with a good round brush, with which it must be well worked in; and not least of the requirements is the use of a properly inert pigment, ground in the best quality of linseed oil. And then, when all of this has been done, there must be ample time allowed for drying. All of this was emphasized in the paper and reiterated in the discussion, but not one man of all the painters present said that he was following these practices. Nor did anyone point to some other who was using the sand blast or allowing time for drying. As a matter of fact, we have a record of but one man in the whole wide range of railway mechanics who uses a sand blast for cleaning his tender tanks before painting, and he claims to be obtaining all the results that would be expected. There seems to be little difficulty in the matter of securing the desired mixtures of paints, but their method of application is frequently as far from this theoretically ideal practice as the usual lack of cleansing the surface is from the use of a sand blast. The paint is loaded with dryer, is put on with a brush as big as one used for whitewash, is given from six to eight hours to dry, and is laid on over all manner of rust and mill scale. Of course, this statement does not apply to passenger cars, but it does to almost everything else; to freight cars, bridges, elevated railway structures, roofs, buildings and floors. Anyone who has eyes has seen the ethics of the painting of metallic structures violated so long and so often that the times when really first-class work has been done are unknown.

We know what is right; why don't we do it? In the case of freight cars it may not pay to paint well or even decently, but surely for bridges and permanent structures it must be better at least to clean the dirt off the surface before applying the paint. If not, why does not someone in authority come out and squarely assert and prove that this idea of using a sand blast is an unnecessary expense, that paint slapped on in any old way is just as good as when applied with an extra expenditure of elbow grease, and that dirt on the surface is just the thing to afford a hold for the paint, serving to lock the new to the old coats? This would make our theories conform to our practice and free our consciences from the burden of the thought of illy-performed duties. The nearest approach to this was a long quotation in Mr. Marshall's paper from a writer who advocated the artificial development of rust over the whole surface before the paint was applied. But the speakers who discussed the paper rejected the idea as absurd, and left us stranded high and dry with the most beautiful theory in the world for the best means of protecting metal surfaces without the citation of a single example of a place where the aforesaid beautiful theory was put into practice.

DIVIDED RESPONSIBILITY FOR RAILWAY MANAGEMENT.

ONE of the points on which the eastern railway presidents laid much stress in their recent testimony in the rate advance cases at Washington is that the financial credit of the railways of the country is now largely in the hands of the Interstate Commerce Commission. The managers still have the duty and responsibility of developing traffic and increasing operating efficiency. To the extent that their efforts to do these things are effective they tend to increase net earnings and strengthen railway credit. Formerly if the results of their work along these lines were insufficient to maintain credit they could supplement it by changes in rates. That is a thing of the past. The Interstate Commerce Commission can now reduce rates and they cannot be advanced without its consent. The power to control rates is the power to prevent increases in traffic and operating efficiency from resulting in increases in profits. The commission, therefore, has as much, or more, power over railway credit as the managers of the roads.

At the hearing in Washington, Commissioner Lane chided those railway officers whose free speaking about the condition of American railways has hurt their credit abroad. No doubt there have been exaggerated statements made as to the seriousness of the results that will come if the roads are not allowed to make all the advances in freight rates that they want to. But the railway manager nowadays is in a very delicate and trying position. He wishes the credit of his road to stand high because he desires to sell its securities at a good price. But he also wishes to earn enough to pay such a return on its securities as will make them permanently attractive. To prevent reductions in rates which will reduce its earnings and secure advances which will increase them, he has to present evidence showing his road's needs. It is not enough to present this evidence to the commission alone. The commission is a fluctuating body. Its members are appointed for terms of only seven years. If it were convinced that a certain policy were right and adopted it, and the public were left unconvinced, the public could and would make changes in the commission which would cause a reversal of its policy. Therefore, the public must also be convinced. But when a road which really needs increased earnings presents fully and vigorously to the commission and the public the facts about its needs, it is pretty apt to hurt its credit. The wise railway manager will recognize the fact that credit, to be permanent, must be built on actual earning capacity, and will tell the facts when this must be done to secure needed increases in earnings, even if the effect be temporarily to injure his road's credit. If others, in trying to get rates reduced or prevent them from being advanced, minimize his road's needs, the railway manager, being human, is apt to get warmed up and magnify them.

The division between the railway managers and the commission of responsibility for the maintenance of railway credit is typical of the division of responsibility which is being made by government regulation in all railway affairs. Formerly it was the duty of the railways alone properly to equip their cars with safety appliances; and if they did not perform that duty they were entirely responsible. Safety appliance legislation has changed this. The commission now prescribes the standards to be used down to the minutest detail. The roads were before, and still are, under a moral responsibility to make their opera-

tion as safe as practicable. But the extent to which it is practicable for them on their own iniative to make it safe has been much reduced, for they must use the appliances prescribed by the commission whether they think them good or otherwise. The government having assumed the responsibility of telling them exactly what appliances they must use, they are pretty sure, being human, not to do much more than the government requires. If the installation and use of the appliances prescribed unduly increase railway expenses, the railways can lay much of the blame on the commission. If the appliances prescribed are not satisfactory and adequate, and, in consequence, accidents do not decrease or do actually increase, much of the blame naturally will be laid on the law and on the commission. On the other hand, the commission naturally will try to put on the railways the blame for any bad results. In these circumstances, who is the public to hold responsible for accidents due to defective safety appliances?

The ceaseless agitation of the railway question and the incessant hearings before state and interstate commissions are interfering most seriously with the fostering of traffic and with needed improvements in railway plant and operating methods. Those in control of the financial affairs of the roads are refusing to allow money to be spent for extensions and improvements while the question of the amount that they shall be allowed to earn is pending. The operating executives, instead of giving all their time to the study of means of effecting economies and increasing efficiency, are giving a large part of it to the preparation of data and arguments to be presented to commissions, law-makers and people, in support of the contention that the roads need more revenue. The traffic officers, instead of giving the bulk of their time to the study of means of developing traffic along their lines, are devoting an entirely disproportionate part of it to preparing evidence and giving testimony to show that they need higher freight rates on the traffic that they already have. The tendency of these things is to prevent rates from being adjusted to fit changing commercial and industrial conditions and to hinder the provision of adequate transportation facilities.

If this condition of things lasts long it will lead to serious results. If, for instance, operating officers continue to give time to the protection of the properties which they ought to give to improvements in methods and plant, and financiers continue to withhold money which ought to be invested in improvements and extensions, the result is going to be—perhaps not this year, but, at any rate, when the commerce of the country gets back to normal—the worst shortage of facilities and congestion of traffic that the country ever saw. The question will arise then as to who is responsible. The railways will say it is because the government has not let them earn enough to make needed improvements and extensions. The commission will say, perhaps, as it said at the time of the car shortage in 1906-7, that it is because the railway owners and managers, wanting in proper appreciation of their duty to the public, have not tried as they ought to provide needed facilities. Whom in that case will the public hold responsible?

With every increase of government regulation, this baneful division of responsibility for railway management, between the commissions and law-makers, on the one hand, and the officers of the railways, on the other, is going to become more marked. The public, in trying to fix the blame for shortcomings of railway management, is apt to be like the man who tried to sit on two stools and occupied the floor. The stockholders will be in much the same plight. They cannot call the government authorities to a direct accountability because the government officials are not accountable to them. And they cannot call the officers of the railways to an account for what the government officials do.

The proper function of government regulation is to exercise a broad, general supervision for the purpose of causing the directors and officers of the railways to do their duty. So long as government regulation is confined within these limits, the managements of the railways can properly be called to account by the government authorities for their errors of omission and commission. But under our present system of regulation the government authorities are stepping in and themselves attempting to perform the detailed duties of the directors and officers. But they cannot properly perform these duties. If the Interstate Commerce Commission were composed of seven men with the wisdom of seven archangels, it could not intelligently and completely do the work that congress requires of it without the sincere and zealous co-operation of railway officers; and this co-operation it never can get so long as it tries to perform duties which railway officers think—and in most cases rightly—is their own proper function. In these circumstances, instead of the commission's being in a position to call the railway officers to account for the results of railway management, it itself properly ought to be held to a strict accountability for the results of railway management. But the public is the only power that can call it to account; and how is the public, with its very limited facilities for learning who is right, when railway officers and commission differ as to the causes of bad results of railway management, to tell who is at fault? It cannot do it now and never will be able to do it.

Just how the problem presented by this condition of divided responsibility is to be solved, it is impossible now to see. The Interstate Commerce Commission is not to blame for it, or, if it is to blame, is so only to a limited extent. The trouble is mainly with the laws for the regulation of railways which Congress has passed. The commission is not a law-making body; it is not a court; therefore, it can neither determine what the laws shall be nor nullify unjust or unconstitutional laws. As an administrative body, it is its sole duty to administer the laws that Congress passes in the spirit in which they are enacted. If the laws require it to try to perform the proper duties of railway officers, it must try to perform them. Any effective remedy of the situation must be applied to its cause; and its cause is the unfair and unwise public sentiment finding its natural expression in equally unfair and unwise legislation.

NORTHERN PACIFIC.

THE increase in operating expenses on the Northern Pacific in the fiscal year ended June 30, 1910, was nearly $6,000,000, or from $67,800,000 in 1909 to $73,800,000 in 1910. This is abnormal. In the first place, last year was the culmination of the very extensive betterment work which has been carried on during the past few years. This betterment work has cost huge sums, which were charged to capital account. The work has also been the direct and indirect cause of higher operating expenses because, in addition to the obviously higher cost of conducting transportation when improvements are made under traffic, the work has made maintenance of way expenses higher than they would be under normal conditions and higher than they probably will be in the future. The work has consisted of relocation of the old line, extensive double-tracking, reduction of grades and replacing light rail with 85 and 90-lb. rail. On June 30, 1910, 2,941 miles of main line was laid with 85 or 90-lb. rail, and it is estimated that by the end of the calendar year 1910 all main line between St. Paul and Duluth, and between St. Paul, Duluth, Seattle and Portland will have been laid with heavy rail, with one or two minor exceptions where changes in curvature or grade are contemplated.

It will be remembered that, under the rules prescribed by the Interstate Commerce Commission, the cost of replacing light rail with heavier rail is divided between expenses and capital account by charging to maintenance of way the cost of the same weight of steel that was previously in track and charging only the cost of the additional weight of steel to capital account.

During 1910 741 miles of main line was laid with new 90-lb. rail. The total cost of maintenance of way and structures was $10,800,000, an increase of $3,000,000, or 38 per cent., over 1909. The standards on main line to which the company is working are: 0.4 to 0.6 per cent. grades; 85 or 90-lb. rail; and 6 to 8

degrees curvature. The higher grades and sharper curves are on the western part of the line.

A program of improvement and betterment similar to that carried out in regard to roadbed has been adopted for equipment. In 1910 there were 1,430 locomotives in service, an increase of 107 over 1909; 1,119 passenger-train cars, an increase of 114 over 1909; and 43,816 freight-train cars, an increase of 2,318 over 1909. It is interesting to note that of the locomotives added in 1910, 40 were Mikado locomotives, with an average tractive force of 46,300 lbs.; six were Mallet compounds with an average tractive force of 64,940 lbs.; and five were Mallet compounds with an average tractive force of 89,540 lbs.

The following table shows the unit costs of maintenance:

	1910.	1909.
*Maintenance of way, per mile.....	$1,324	$980
†Repairs, per locomotive.....	1,916	1,751
" " passenger car	524	448
" " freight car	58	42

*Per mile of first, second, third, etc., track, the cost of two miles of siding and switch tracks being taken as equal to the cost of maintenance of one mile of main track.

†This is for repairs only and does not include renewals, depreciation or superintendence charges.

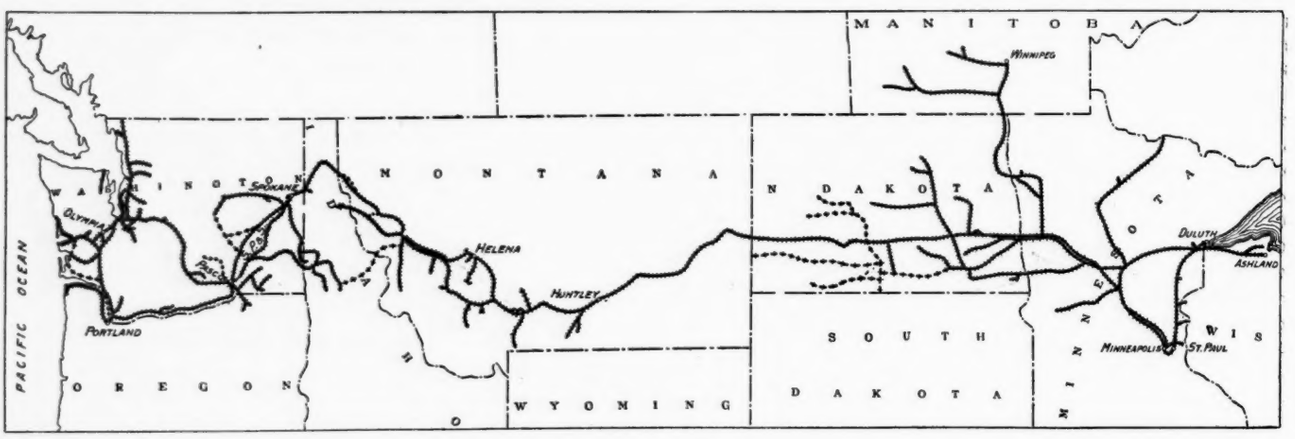
The figure for maintenance of freight cars is especially noticeable, and the annual report states that of the total number of freight cars on the road on June 30, 1909, only 1,744, or 3.98 per cent., were in need of repairs costing $5 or more. The increase in number of freight cars in service in 1910 amounted to 5.59 per cent. of the total cars in service at the beginning of the year.

An additional reason for the abnormally high cost of operation in 1910 was the very severe weather in December and January, and the strike of the switchmen. These two causes of higher operating costs may be classed as accidental, and certainly a recurrence in the present year of anything corresponding to the switchmen's strike after the increase in wages that has been granted is quite unlikely.

Still another reason for extraordinarily high operating expenses was that the increase in gross business came largely in passenger business, necessitating a much larger passenger train mileage. Transportation expenses amounted to $24,000,000 in 1910, an increase of $3,700,000, or over 18 per cent. More than half of this increase came from higher cost of labor, due both to the increase granted in wages and to the greater train movement. Passenger train mileage amounted to 12,600,000 miles in 1910, an increase of 3,000,000 miles, or over 31 per cent., above 1909. The Alaska-Yukon-Pacific Exposition was held in Seattle from June 1, 1909, to October 16, and accounted for a good part of the heavier passenger traffic on the Northern Pacific. In addition to this, the Flathead, the Coeur d'Alene and the Spokane Indian reservations were opened, and land registration was in progress from July 15, 1909, to August 5.

Total operating revenues amounted in 1910 to $73,800,000, an increase over 1909 of $5,900,000; but of this increase, only $1,700,000 was from freight revenue, the remaining increase of $4,200,000 being almost entirely from passenger revenue. The freight revenue was 3.85 per cent. greater in 1910 than in 1909. This is considerably less than the normal increase in freight revenue, and compares with an increase of more than 20 per cent. in freight revenue during the same period on the Great Northern. It, however, speaks well both for the Northern Pacific and for the development of the country that the Northern Pacific was able to show any increase in freight business at all in 1910, since the road had to meet new and severe competition from at least four important sources. The Chicago, Milwaukee & Puget Sound more or less closely parallels the Northern Pacific all the way from the Missouri river to the Pacific coast. In many places through Montana and Idaho the two roads are but a few miles apart, and nearly all the local business through these states that is now going to the Puget Sound would of necessity have gone to the Northern Pacific if the St. Paul's new line had not been built.

The second important competitive force that the Northern Pacific is called on to meet is due to the loss of business that is being diverted from its line by a connection at Billings between the Great Northern and the Chicago, Burlington & Quincy. Before this connection was made the Burlington had only the Northern Pacific to exchange traffic with at Billings.



Northern Pacific.

Another source of competition has been the Duluth extension of the Minneapolis, St. Paul & Sault Ste. Marie, which parallels the Northern Pacific's line from St. Paul to Duluth. Presumably this line is a heavy carrier of grain.

President Elliott says that about half of the total business that is being done by the Spokane, Portland & Seattle is being exchanged with the Northern Pacific, and that nearly all of the traffic originating between Spokane and points east, and the Gray's Harbor territory, in the state of Washington, and points south, including Portland and business handled via Portland, is now commonly routed over the Spokane, Portland & Seattle. It is probable, however, that this loss of business to the Northern Pacific is much more than compensated for by the business originating on the Spokane road which is delivered to the Northern Pacific. In any case, the business given to the Spokane road is eastbound business and can be easily spared.

The outlook for future traffic is bright along the whole road. In the eastern part, the company has to build and improve its lines rapidly to keep up with grain production. The Dakota division, for instance, which is on the present western border of the hard wheat country, is building 200 miles of branches. Farming is spreading westward in Montana, and it is expected that stock raising will increase rather than diminish with the growing of diversified crops. In western Montana Indian lands are being opened, and, while the Indians retain the most fertile sections, white settlers are getting land which will be most profitable under "dry farming" or, more properly, intensive cul-

tivation. Irrigation in Idaho and Washington is bringing big returns in fruit growing, particularly, and in other high priced crops.

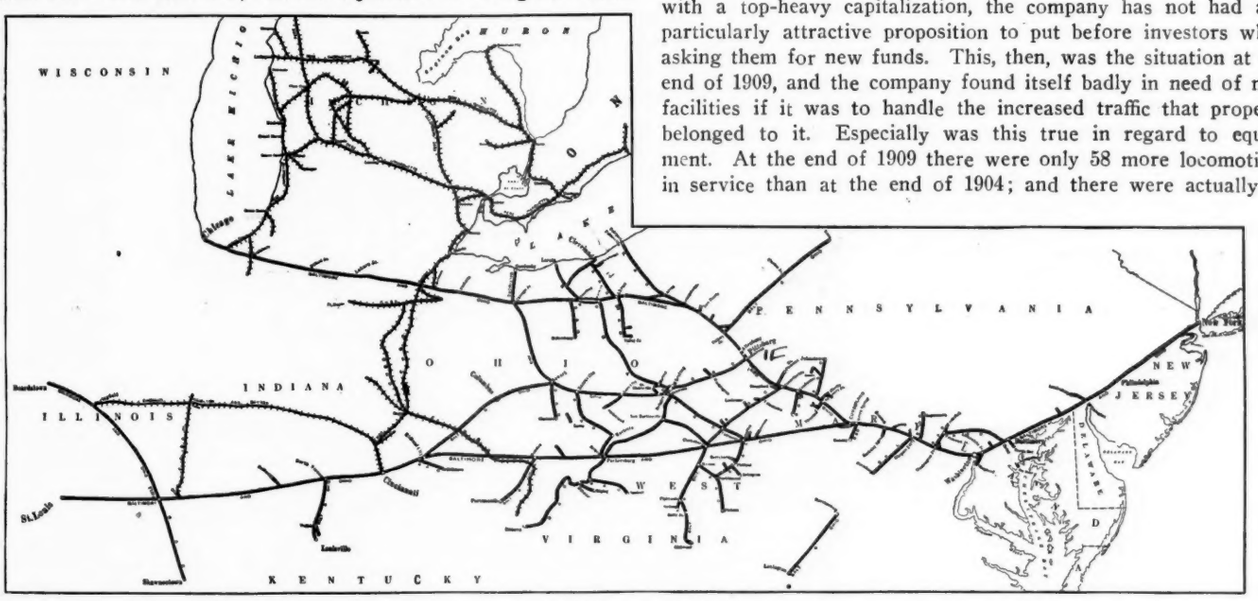
The following table shows the results of operation in 1910 compared with 1909:

	1910.	1909.
Average mileage operated	5,765	5,671
Freight revenue	$48,758,736	$47,073,305
Passenger revenue	21,333,313	17,330,608
Total operating revenue	74,525,826	68,460,747
Maint. of way and structures	10,842,955	7,847,050
Maintenance of equipment	8,992,137	7,845,689
Traffic	1,036,404	919,199
Transportation	24,045,197	20,305,621
Total operating expenses	45,987,405	38,020,005
Taxes	3,622,000	2,547,835
Operating income	25,518,896	28,322,267
Gross corporate income	29,475,201	32,019,905
Net corporate income	22,296,259	21,639,350
Interest and commisions on new stock subscriptions	.....	3,268,416
Dividends	17,360,000	14,105,000
Surplus	4,936,259	7,534,350

BALTIMORE & OHIO.

TO understand the situation in Baltimore & Ohio affairs at the beginning of the last fiscal year it is necessary to get clearly in mind the physical characteristics of the road and the nature of its traffic, and to review briefly the financial history of the company.

The Baltimore & Ohio has been characterized as both a trunk line and a soft coal road, but the importance of low-grade traffic



Baltimore & Ohio.

The Cincinnati, Hamilton & Dayton and Pere Marquette are shown by a cross-hatched line. From Philadelphia to New York the B. & O. simply has trackage rights.

entirely outweighs what may be strictly called trunk line business. About 65 per cent. of the total tonnage carried in 1910 was products of mines, 43 per cent. of the total tonnage being bituminous coal. The comparatively small importance of such commodities as grain may be understood when it is noted that the tonnage of stone, sand and like articles totaled 4,600,000 tons in 1910, while the total tonnage of grain amounted to but 1,300,000 tons. The coal tonnage originates at about the grade summit on the road and moves both ways. Most of the coal originates in the territory west of Cumberland and in the Connellsville district, part of it moving to the Pittsburgh district and the remainder to seaboard at Baltimore. At Cumberland the two lines, one coming from Chicago and the other from Cincinnati, join, and the road from Cumberland to Baltimore, which is double track, is compelled to handle the traffic brought to it from two double-track roads.

The Baltimore & Ohio was originally laid out over difficult country. The road is exceedingly crooked and originally had high grades. This explains the great sums that have been spent in the past on rebuilding the road, and the productiveness of the country through which the road runs is the justification for these large expenditures. Gross earnings per mile of road in 1910 amounted to $20,048.

At the beginning of the last fiscal year the road was being worked just about up to its physical capacity. In the past five or six years ample sums have been spent on maintenance of way proper and on repairs of equipment, and in addition considerable sums have been spent on betterment to the road; in fact, in the testimony before the Interstate Commerce Commission in the rate hearings it was shown that the company had put back into the property for improvement about 50 cents for every dollar paid in dividends. Nearly all of this, however, in the past five or six years has been put into road betterments rather than into additions to equipment.

When the Baltimore & Ohio was reorganized in 1898 there was no radical scaling down of indebtedness or capitalization; and the great success that the company attained after its reorganization was due in part to the great prosperity of the country that the road served, and in part to the fact that the company was fortunate in securing unusually efficient management.

To repeat, first, the road runs through highly competitive territory, which is capable of furnishing an enormous traffic of low-grade products; second, it has been necessary to spend very freely for additions and betterments to keep the road up to the development of the country; and third, while not overburdened with a top-heavy capitalization, the company has not had any particularly attractive proposition to put before investors when asking them for new funds. This, then, was the situation at the end of 1909, and the company found itself badly in need of new facilities if it was to handle the increased traffic that properly belonged to it. Especially was this true in regard to equipment. At the end of 1909 there were only 58 more locomotives in service than at the end of 1904; and there were actually 53 less passenger cars and 39 less freight cars in 1909 than in 1904. In 1910, 284 locomotives and 15,000 freight cars were ordered. As we have said, the two-track line from Cumberland to Baltimore was having dumped on it the tonnage from two two-track lines terminating at Cumberland. It was absolutely necessary to add at least a third track from Cumberland to Washington Junction, and in time it will unquestionably be necessary to make this a four-track line.

In January, 1910, Daniel Willard, vice-president of the Chicago, Burlington & Quincy, at the head of the operating department, was elected president of the Baltimore & Ohio, and Oscar G. Murray was elected chairman of the board. Mr. Willard had the reputation on the Burlington of being one of the best operating men in the country and a tremendously hard worker. Before going to the C., B. & Q. he had been on the Erie, and previous to that had been general manager of the Baltimore & Ohio. The new management has laid out a general scheme for the betterment of the line to facilitate the handling of traffic and render operation more effective and economical.

It is not unusual for industrial companies to make a revalua-

tion of a part of their plant and to write off on their balance sheet a sum for depreciation, and it is on this theory that there is an attainable rate of depreciation of plant that the Interstate Commerce Commission ordered the railways to make an allowance in their income accounts for depreciation of equipment. It is, however, quite unusual, except in a reorganization, for a railway company to write off from the asset side of its balance sheet a large sum covering the depreciation in value of plant in past years; but this is the course that has been taken by the Baltimore & Ohio under its new management. During the fiscal year 1910 a committee of officers of the operating, mechanical and accounting departments made a physical appraisal of the rolling stock and motive power of the company and reported that the book value of the equipment, as shown on the balance sheet of June 30, 1909, was higher by $8,500,000 than the appraisal value which was fair in the judgment of these officers. On the recommendation of the executive officers, the board of directors approved charging to appropriated surplus this $8,500,000, writing down the value of equipment in capital account by $7,100,000 and crediting $1,400,000 to reserve for accrued depreciation.

This, taken in connection with the orders for new equipment, is possibly the most striking example in the annual report for 1910 of the vigorous policy of betterment and physical organization, but it is only one of many.

The total expenditures called for immediately when the general plan referred to by President Willard was decided on include $5,550,000 charged to construction during the past year, $23,000,000 for 284 locomotives and 15,000 freight cars, and $20,000,000 for improvements to road, etc.

To finance these improvements the Baltimore & Ohio found it necessary to issue short term notes, the bond market not being favorable for permanently funding the amount of money required. The company sold $10,000,000 one-year 4 per cent notes dated March 10, 1910, and subsequently authorized the issue of $50,000,000 4½ per cent. three-year notes dated June 1, 1910, and secured by the deposit of the B. & O.'s Reading stock and B. & O. Chicago Terminal first mortgage bonds. Of the three-year notes, $10,000,000 were reserved to retire at maturity the one-year notes, and the remaining $40,000,000 notes were sold. The balance sheet shows the results of this financing, but is not comparable with the balance sheet of 1909 because of the new form prescribed by the Interstate Commerce Commission. After the changes made necessary by writing off depreciation on equipment and taking into the general balance sheet affiliated companies, which is done this year for the first time, road and equipment investment up to June 30, 1907, amounted to $266,000,000, and since June 30, 1907, there has been $21,000,000 invested in road and equipment. After subtracting the reserve for accrued depreciation amounting to $6,000,000, total capital assets amounted to $281,000,000. Working assets amounted to $79,900,000, of which $11,800,000 was cash, $7,400,000 stocks and bonds issued or assumed by the Baltimore & Ohio but held in the treasury, and $39,600,000 loans and bills receivable. Working liabilities amounted to $20,100,000, this sum including the $10,000,000 one-year notes.

Total operating expenses amounted to $61,300,000 in 1910, comparing with $51,200,000 in 1909. The greater part of this $10,200,000 increase came in maintenance expenses; transportation expenses cost $29,700,000 in 1910 and $26,300,000 in 1909, an increase of $3,400,000. As is the case on other roads, and to about an equal extent, the increased cost of transportation was due to the increase in wages paid and to the higher cost of fuel due to the greater train movement. The following table shows the unit costs of maintenance:

	1910.	1909.
*Maintenance of way, per mile	$1,671	$1,396
†Repairs, per locomotive	2,889	2,184
" " passenger car	690	590
" " freight car	70	56

*Per mile of first, second, third, etc., track, the cost of two miles of siding and switch tracks being taken as equal to the cost of maintenance of one mile of main track.

†This is for repairs only and does not include renewals, depreciation or superintendence charges.

The larger maintenance charges have already been commented on.

Traffic statistics show that the total number of tons carried one mile amounted to 12,024,600,000 tons, an increase of 1,975,300,000 compared with 1909. The average distance each ton was carried was 191 miles, a decrease of five miles from the 1909 figure; the average earnings per ton per mile were 5.77 mills, a decrease of 0.4 mills; the average train load was 442 tons, an increase of 14 tons over 1909.

The total number of passengers carried one mile was 763,450,000, an increase of 42,690,000; the average earnings per passenger per mile were 1.897 cents, an increase of 0.017 cents. The large increase in ton mileage and passenger mileage is reflected in increases in earnings as shown by the table in the end of this review.

The Cincinnati, Hamilton & Dayton, shown on the map with its controlled line, the Pere Marquette, has been operated during the entire fiscal year under Baltimore & Ohio control. Among the advantages of control of this line are the new markets it affords to coal producers on the Baltimore & Ohio. Both the B. & O. and the C., H. & D. face new competition in the near future. The Hocking Valley line of the Chesapeake & Ohio will, within the next year or two, be given a considerable part of the coal tonnage consigned to the Lakes that the C. & O. is now turning over to the C., H. & D. The Western Maryland is building an 87-mile line from Cumberland to a connection with the Pittsburgh & Lake Erie. The same factors, however, that make it necessary for the B. & O. to increase its facilities so greatly, namely, the industrial growth of the country served by the road, bid fair to offset the competition.

The following table shows the results of operation in 1910 compared with 1909:

	1910.	1909.
Average mileage operated	4,434	4,460
Freight revenue	$69,408,113	$58,355,112
Passenger revenue	14,485,585	13,551,238
Total operating revenue	88,901,252	76,412,856
Maintenance of way	11,661,410	9,694,560
Maintenance of equipment	16,373,776	11,810,507
Traffic	1,877,203	1,717,388
Transportation	29,738,992	26,346,960
Total operating expenses	61,333,801	51,163,981
Taxes	2,469,964	2,271,576
Operating income	24,497,854	22,438,050
Gross corporate income	28,715,752	25,785,307
Net corporate income	16,247,587	*13,736,006
Additions and betterments	415,761	549,572
Dividends	11,474,213	12,472,982
Surplus	4,357,614	713,452

*The income account for 1909 has been restated by eliminating debits and credits of interest on bonds in treasury.

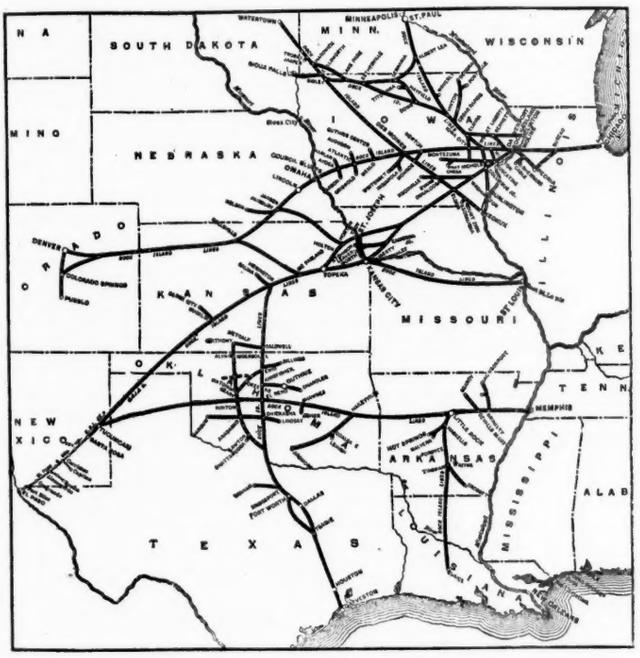
FOR seven months of the last fiscal year the Chicago, Rock Island & Pacific Railway was operated independently of the St. Louis & San Francisco. A controlling interest in the stock of the St. Louis & San Francisco had, previous to that time, been held by the Chicago, Rock Island & Pacific Railroad, all of the stock of the *Railroad* company being owned by the Rock Island Company. In January the Railroad company sold its interest to B. F. Yoakum and associates. As a matter of fact, the two properties, the Rock Island and the Frisco, were never operated as a closely-knit system. The Frisco is a homogeneous property in itself, but the Rock Island sprawls out into so many different sorts of territory that while a part of its system may have benefited from joint operation with its former partner, the operation of the company as a whole was not affected to any appreciable extent by the loss of the Frisco.

To find any system that could be at all accurately compared to the Chicago, Rock Island & Pacific, it would be necessary to compile some sort of composite figures from the Hawley lines. If the Clover Leaf, the Alton and the Katy were combined they would form a system not so different from the Rock Island. And this explains the nature of the problems that have to be solved by the C., R. I. & P. management. They have to operate as a single unit a system of lines that are, geographically, three or more distinct units.

For the first time the Rock Island annual report classifies lines as to main lines and branch lines. The main lines are as

follows: One running from Chicago to Colorado Springs, with lines via both Omaha and Kansas City; one running from Kansas City to a connection with the El Paso & Southwestern, which gives it its route to El Paso, Tex.; the line from Kansas City to Dallas, Tex., and the line from Memphis to El Paso are also classified as main lines, and the line running south from Little Rock, Ark., to Unice is treated as main line. In 1904 less than two miles of track was laid with 85-lb. rail, and only about 800 miles of track had rock ballast. At the end of the fiscal year 1910 more than 26 per cent. of the total 4,695 miles of main line, first, second and third tracks, was laid with 85-lb. rail and 45.59 per cent. of the main line trackage was laid with 80-lb. rail. Moreover, in 1910, 26 per cent. of this main line trackage was rock ballast. The chief efforts of the management have apparently been devoted to improving the main lines; a large part of branch line mileage is still laid with light rails and is unballasted.

In 1910 the Rock Island earned total operating revenue amounting to $66,200,000, which is greater by $5,000,000, or a little over 8 per cent., than the gross of 1909, but operating expenses amounted to $48,100,000, an increase of $5,600,000, or



Chicago, Rock Island & Pacific.

13 per cent. over 1909, so that the operating income, after the payment of taxes, was less by $1,100,000 in 1910 than in 1909. After the payment of interest and rentals, the Chicago, Rock Island & Pacific Railway Company had $4,700,000 balance available for dividends in 1910, as compared with $6,200,000 in 1909. Dividends of $3,700,000 were paid to the holding company in 1910 and $3,900,000 in 1909, leaving a surplus of about $1,000,000 last year, as compared with the surplus of $2,300,000 the year before. It will be remembered that the dividends paid to the holding company, the Chicago, Rock Island & Pacific Railroad, are used to pay the interest on *Railroad* company bonds. The Rock Island Company stock, which is the stock that is quoted on the New York Stock Exchange, simply represents control of the Railroad company which in turn controls the C., R. I. & P. Railway. The Rock Island Company's organization is such that the preferred stock, of which there is $54,000,000, elects a majority of the board of directors and therefore carries control of the company, notwithstanding that there is $96,000,000 common stock. Neither the common nor preferred stock of the Rock Island Company is paying dividends.

The $5,000,000 increase in operating revenue of the operating company was due to an increased revenue from both freight and passengers. Freight revenue last year amounted to $42,200,000, an increase of $3,100,000 over 1909. Freight is about 64 per cent. of the total operating revenue. The number of tons of revenue freight carried totaled 19,200,000 in 1910, an increase of 2,000,000 over 1909, and the number of tons moved one mile totaled 4,567,000,000 in 1910 as against 4,160,000,000 in 1909. The revenue per ton mile on the Rock Island is 9.2 mills. This is less by .2 mills than the revenue per ton mile in 1909, and is slightly less than the average revenue per ton mile on either the Frisco or the Santa Fe.

The average haul of revenue freight in 1910 was 238 miles, or about four miles less than the average haul in 1909. The average train load of revenue freight was 257 tons in 1910, or 7 tons less than in 1909. Loaded freight car mileage totaled 303,100,000 in 1910 as against 274,700,000 in 1909, and empty mileage totaled 122,400,000 in 1910 and 107,800,000 in 1909.

From the geographical position of the Rock Island it is apparent that its tonnage is very diversified. In 1910, 31.93 per cent. of the total tonnage carried consisted of products of mines; 12.34 per cent. products of forests; 22.13 per cent. products of agriculture; 19.55 per cent. products of manufactures, and 7.08 per cent. live stock and animal products. The tonnage of every important commodity, with the exceptions of grain and live stock, was greater in 1910 than in 1909; the most notable increase in tonnage being, as might be expected, in manufactures. Last year 3,700,000 tons of manufactures was carried, which is 20 per cent. more than in 1909.

Passenger revenue last year amounted to $19,400,000, an increase of 8 per cent. over 1909. The number of passengers carried one mile was 1,016,000,000. The average revenue per passenger per mile was 1.91 cents in 1910 and 1.88 cents in 1909. This very low passenger rate may be in part explained by the fact that 1,346 miles of Rock Island lines lie in Oklahoma and 476 miles in Texas. In connection with the hostility of these states to railways it is worth while noting that the taxes of the Rock Island amounted to $2,900,000 in 1910. This is an increase of 26.68 per cent. over the taxes of 1909, and the 1909 taxes were greater than the 1908 taxes by 26.87 per cent.; during this time there has been only a comparatively small increase in Rock Island mileage.

As on other lines, the increase in operating expenses last year was due both to higher transportation expenses, because of greater train movement and increased cost of labor, and to more liberal expenditures for maintenance. Transportation last year cost $25,200,000, or 10 per cent. more than in 1909. Maintenance of way cost $10,700,000, or 18 per cent. more than in 1909, and maintenance of equipment cost $8,500,000, or 13 per cent. more than in 1909.

The following table shows the unit costs of maintenance:

	1910.	1909.
*Maintenance of way, per mile	$1,373	$1,146
†Maintenance per locomotive	2,530	2,429
" " passenger car	820	801
" " freight car	80	68

*Per mile of first, second and third main track owned and leased.
†This is the cost of repairs and charges for renewals and depreciation, but includes no superintendence or other overhead charges.

For some reason not stated, the Rock Island, while making its annual report in other respects in the form prescribed by the Interstate Commerce Commission, does not show the cost of repairs, renewals and depreciation of equipment separately, so that the figures in the accompanying table are not comparable to those given in our columns for other roads, which include repairs only and take no account of renewals and depreciation. The company in its estimate of the average cost per mile for maintenance takes no account of the side track and spur mileage. If the maintenance of two miles of siding and switch track is taken as equaling the cost of maintaining one mile of main track, the maintenance figure for 1910 would be $1,206 per mile.

The balance sheet as of June 30, 1910, shows total working assets of $34,300,000 and working liabilities of $10,000,000. Of the working assets, $4,500,000 was cash, an increase in cash of a little over half a million over 1909. Included in working

assets are $17,100,000 marketable securities; this includes $7,500,000 Railroad company debentures sold to the Railway company to cover the loss on the sale of St. Louis & San Francisco stock and the retirement of collateral trust bonds secured on this stock. These bonds, of course, if they are ever to be sold to the public, will have to be guaranteed by somebody—presumably the railway company.

Unusual interest attaches to Rock Island affairs this year, because of the much-discussed transactions that have taken place in Rock Island stock. When the Frisco was divorced, B. F. Yoakum and his associates retired from the board of directors of the Rock Island Company and W. H. Moore and D. G. Reid were left presumably in undisputed control. In July, when it was announced that Kuhn, Loeb & Co. had taken over stock bought by the Pearson-Farquhar syndicate, it was understood that these holdings included a large block of Rock Island stock. Later it was announced that Phelps, Dodge & Co., who control the El Paso & Southwestern, had bought from Kuhn, Loeb & Co. this block of Rock Island preferred stock, amounting to about 20 per cent. of the total outstanding. Just why this firm, which has been identified with copper mining and smelting properties rather than with railways, should have arranged to acquire a considerable minority interest in Rock Island stock is really hard to understand. The investment cannot conceivably make any return in dividends in the near future. It may, of course, be considered an investment which Phelps, Dodge & Co. feel that they are justified in making without present return, in the hope that in time developments of the country and the development of the Chicago, Rock Island & Pacific Railway will make it profitable. There are also advantages to be gained by the El Paso & Southwestern through a closer relationship with the Rock Island.

The following table shows the operation of the C., R. I. & P. in 1910, compared with 1909:

	1910.	1909.
Average mileage operated	8,044	8,026
Freight revenue	$42,218,880	$39,158,053
Passenger revenue	19,378,174	17,883,379
Total operating revenue	66,220,579	61,184,887
Maint. of way and structures	10,673,387	9,051,830
Maintenance of equipment	8,455,746	7.512,889
Traffic	1,795,262	1,441,215
Transportation	25,195,579	22,848,052
Total operating expenses	48,069,369	42,413,495
Taxes	2,876,701	2,270,865
Operating income	15,274,509	16,400,527
Gross corporate income	15,497,741	16,611,998
*Net corporate income	4,747,881	6,166,231
Dividends	3,743,272	3,930,019
Surplus	1,004,609	2,236,212

*After the subtraction of $72,583 in 1910, and $16,577 in 1909, for betterments on leased lines.

NEW BOOKS.

Power Signaling in Great Britain, British Colonies, Belgium, France and Italy.. Report by L. Weissenbruch and J. Verdeyen to the International Railway Congress. Printed in the *Bulletin* of the Congress, for July, 1910, page 3319. Brussels, Belgium.

Power signaling in the countries named is the subject, though not the title, of a full and careful report (Report No. 4) which was prepared as above for the congress held last summer. Mr. Weissenbruch is director of safety appliances of the Belgian state railways, and Mr. Verdeyen is assistant to Mr. Weissenbruch. The subject which was allotted to these gentlemen was the general one of improved centralization of switch and signal operation, but, as the authors observe in their introductory note, there is no improvement to be noted except in power signaling, or, as they would call it, "fluid-operated cabins"; and so they confine themselves to this. The report fills 40 pages of the *Bulletin* and contains a succinct history of what has been done in this field, in Europe, beginning back with the water-pressure system of Bianchi & Servetaz. The salient features of this and the later systems: the M. D. M. system of the Northern of France, the Westinghouse, the Taylor, the Webb & Thompson, the Ducousso & Rodary, the Siemens & Halske, the Siemens Brothers and others, are carefully described, with drawings. Mention is made of A. H. Johnson's system, which was installed experimentally on the Metropolitan Railway of London.

RAILWAY CAPITAL AND CAPITALIZATION.

BY WILLIAM Z. RIPLEY.
Professor of Economics, Harvard University.

II.

Having allowed for duplication of capital within a given system, it is then necessary to reckon with outside investments. These may consist of holdings of stocks and bonds in other railway systems, or they may represent investment in other enterprises than transportation. As for the first of these, investments in other railways outside its own system, these are somewhat imperfectly given by the Report on Intercorporate Relations. The amount of what are designated as "Minority Holdings" of railways in other roads, however, in all probability gives returns sufficiently accurate for our general purposes. They include all of the investments of this kind which are substantial in amount. Majority holdings in other companies would bring those roads "within the system," as just described; and would appear in the tables under that heading. As for the miscellaneous investments, their scope is surprisingly wide. It is clear that the value of all these investments must also be subtracted from the total of securities outstanding for each system, in order to leave only the net capitalization dependent upon earnings from operation for its support. The following table has been thus constructed for a number of important railways, finally reducing this net capitalization in each case to a mileage basis for purposes of comparison. These roads are arranged in an ascending scale, with reference to this last figure—net capitalization per mile—which is the basis for all subsequent calculations:

A matter of extraordinary difficulty has been the treatment of corporations "held jointly" by several different systems. These are usually terminal companies in the larger cities. The Chicago & Western Indiana Railroad Company, for instance, operates some 48 miles of line and is capitalized at $33,750,000. It is owned jointly by the Atlantic Coast Line, the Erie, the Wabash, the Grand Trunk and the Rock Island. It would seem as if properly the proportionate share of its total capitalization held by each participating road should be an allowable deduction from the total outstanding securities of that road in determining net capitalization. The data for doing this, however, aside from the statistical labor involved, are not available in many cases. And what, from the point of view of principle, is even more important, if this were done, the proportionate division of income to each participant would need to be likewise made. Inasmuch, however, as the earnings of these companies, thus jointly held, are not usually included in the statements of individual systems, it seems fairer to eliminate them entirely. Otherwise, at a later point in our calculations, as will appear, we should be taking account of their capital issues, while still neglecting to include their earnings. Therefore, in the case of all these jointly held companies—such again as the St. Louis Terminal Association and the Richmond-Washington Company—their mileage roughly totalized, and the aggregate of their security issues (given separately in a column in our table) have in each case been eliminated entirely. This procedure is radically different from the method properly adopted in the Report on Intercorporate Relations, which, as has been said, sought to determine, not the particular, but the general capitalization of the entire railway net. The deduction of the total rather than the proportionate capitalization of these jointly held companies, from the total outstanding capitalization of each participating system, in order to ascertain net capitalization, obviously over-corrects the error. It weighs the results on the side of conservatism, making the capitalization of each participating road appear less than it should be. Strong companies which own all their own terminals, instead of dividing ownership with other roads, are made to appear more heavily capitalized by comparison than they should. And, from the operating point of view, it is absurd, of course, to eliminate these terminal companies at all. Where would the New Haven and Boston & Albany roads be without the Boston

Terminal Station? Yet the capital of $14,500,000, representing it has been eliminated from our calculations altogether; and, worse than that, this total capitalization has been deducted from each participant. The main plea in extenuation, however, is that greater error would result from any other course.

What shall be said of this procedure, as applied to other jointly held companies, than mere terminal associations? The Chicago, Indianapolis & Louisville (Monon) is jointly owned by the Louisville & Nashville and the Southern Railway. At the date of our calculations the Chicago & Alton was jointly held by the Union Pacific and the Rock Island. Other notable instances of roads in this class are the San Pedro, Los Angeles & Salt Lake and the Colorado Midland. The maximum of bewildering complexity in ownership appears in the Little Kanawha Syndicate or the Southwestern Construction Company.* A number of different roads are interested in the former, but the Southern Railway owns about 40 per cent. of its capital stock. In this case, as in many others in this class, such substantial investments appear in our tables and are duly accounted for under the head of "Minority Holdings" or investments "Outside the System." To deduct them again from gross capitalization, as jointly held companies, is undoubtedly duplication. Yet how can it be avoided; and if it could be, would it materially affect our conclusions?

The answer is positive. The exclusion of such jointly held companies makes little difference in the final result for most railways. This is particularly true of the Union Pacific and the New York Central. For others like the Reading and the Atchison, the net capitalization is actually increased by elimination of jointly held corporations. For some few roads, notably the weaker companies, this factor is of greater moment. The net capitalization per mile of the Wabash company was brought down by eliminating jointly held companies from $119,000 to $92,000 per mile. The Illinois Central's capitalization came down from $52,000 to $39,400 per mile. There can be no doubt that in any detailed computation ownership of the jointly held companies should be apportioned; and allowance for them made. In this case, however, it seemed fairer to the few companies detrimentally affected to rule them out. And this at a considerable expenditure of statistical labor has been done, in order to be on the safe side.

Turning now to our table of figures, the most surprising feature is the wide range of capitalization, from $30,800 per mile for the St. Paul road to nearly six times that figure in the case of the Erie Railroad. Nor is any broad classification of systems possible. The granger roads and those of the less densely populated regions seem to be in a general way relatively low in capitalization; while the great trunk lines and the coal roads are heavily laden with stocks and bonds. Yet exceptions are almost as frequent at normal instances. The prime fact is that before any definite financial conclusions as to the relative burden of capitalization of individual properties are permissible, a number of important considerations must be taken into account. Most of these are purely technical and involve detailed information as to physical facts. In the first place, the above figures are based upon miles of line and not upon miles of track. Systems like the Pennsylvania, largely double tracked and in part four tracked, cannot fairly be compared with single-track lines. This company recently reported 4,877 miles of extra and siding track in addition to its 3,679 miles of first track. Here is a possible error in comparisons of over 100 per cent., unless the additional cost of such trackage be added to that of "roadway" or of "main line." Careful allowance for such differences should always be made. The physiography of the country must be known. The low capitalization of the Northwestern, St. Paul or Atchison systems, built across open plains, by comparison with the Union Pacific or the Denver and Rio Grande, constructed across the Rocky Mountains, is partly accounted for on that ground. No comparison of capitalization is fair until the density of population is known. This has compelled enormous expenditures for abolition of grade crossings in the Eastern States, an expense not imposed upon roads in the West and South. Nor is a comparison of capitalization of two roads in the same region fair until expenditures for this purpose are known. The New Haven has abolished nearly all its grade crossings. The Boston & Maine still has thousands of highways unguarded. Entirely apart from the relative proportions of duplicate trackage, always in favor of the New Haven road, this difference deserves consideration. The value of terminals must, of course, be distributed over the whole line. Roads like the Pennsylvania, New York Central, Northwestern or Illinois Central, with enormous holdings of real estate in the primary centers of population, are in a class by themselves. Railways either tapping no very large cities, or, if so, relying upon rented property or trackage rights, lack one of the principal bases for a heavy capitalization.

Yet further allowance must be made before drawing final conclusions as to capitalization. It makes a great difference as to the age of the property and the conditions under which it was promoted and built. All the pioneer roads had to sell bonds at heavy discount in order to secure funds. These debts maturing at par, the charge for discount on bonds may have been a heavy item of initial cost. The Western Pacific, financed during the panic of 1907, did not realize, it was alleged, over $40,000,000 in cash from the sale of $50,000,000 of bonds at par. Here is an expense of $10,000,000 to be charged to cost of construction. On the other hand, the Pacific Coast extension of the St. Paul system was financed by sale of its own stock to its own shareholders at par. The only additional construction cost was the

CAPITALIZATION, JUNE 30, 1906.

System	Mileage*	Total Outstanding	Holdings Within System	Minority Holdings in Other Systems	Misc. Investments (Approx.)	Jointly Held (Approx.)	Net Capitalization per Mile
United States	216,804	$18,227,196,000	$5,075,702,000	$479,510,000†	$460,302,000		$58,050
C., M. & St. Paul	7,244	251,131,000	13,899,000		1,116,000	12,800,000	30,800
Chicago & North Western	7,631	291,304,000	25,673,000	18,800,000	2,661,000	7,000,000	31,000
Missouri Pacific	6,885	514,872,000	169,597,000	37,155,000	8,658,000	67,000,000	33,700
Illinois Central	5,700	481,689,000	162,036,000		2,000,000	93,000,000	39,400
Seaboard Air Line	2,878	217,291,000	73,067,000	123,000	861,000	26,000,000	40,700
Southern Railway	9,176	779,393,000	137,976,000	6,969,000	2,150,000	196,000,000	47,500
Chicago, Rock Island & Pac.	14,504	1,510,310,000	636,172,000	580,000	15,285,000	133,700,000	50,000
Atchison, Topeka & Santa Fe	9,442	809,700,000	308,200,000		14,800,000	9,000,000	50,600
Boston & Maine	3,340	212,759,000	26,084,000	33,000	700,000	1,000,000	55,000
Great Northern	6,097	484,738,000	118,343,000	490,000	13,776,000		57,600
Southern Pacific	9,733	1,092,597,000	458,909,000		55,095,000	8,500,000	58,600
Union Pacific	7,665	937,006,000	264,051,000	136,789,000	30,590,000	8,900,000	64,800
Northern Pacific	6,549	509,422,000	44,206,000		18,500,000	20,000,000	65,000
Denver & Rio Grande	2,782	348,408,000	87,871,000		7,440,000	242,000,000	82,000
New York Central	8,730	1,068,173,000	215,232,000	61,705,000	16,500,000	36,600,000	84,500
Pennsylvania	10,045	1,674,416,000	437,195,000	126,472,000	76,806,000	163,600,000	86,400
Norfolk & Western	1,886	185,662,000	17,165,000	24,900	1,754,000		88,000
Great Western	1,410	188,374,000	54,592,000		800,000	6,300,000	90,000
Wabash	2,609	315,550,000	54,900,000		19,100,000	105,000,000	92,500
New Haven	2,755	436,559,000	118,007,000	57,250	37,400,000	15,000,000	96,600
Baltimore & Ohio	4,600	865,847,000	294,062,000	31,486,000	7,400,000	42,700,000	106,000
D., L. & W	1,034	134,915,000	11,981,000	1,851,000	4,569,000	6,800,000	115,000
Reading	2,288	531,522,000	115,791,000	2,686,000	25,500,000	4,500,000	169,000
Erie	2,373	565,706,000	109,427,000	3,006,000	9,101,000	43,600,000	169,000

*Owned, less jointly held. †Holdings, outside the system.

*Report on Intercorporate Relations, p. 26.

interest on the investment during the period of construction, before earnings began to come in. The only offset for these heavy expenses of pioneer roads is the fact that they are not only seasoned properties, but enjoy all the advantages of appreciation of real estate values incident to the growth of the country. Surely the land grant roads have received full compensation for the heavy expenses of financing in the early days from this source.

It is equally important to consider the structure of the system. The Chicago Great Western is nearly all main line, such as it is. Its capitalization figures are not reduced by much lightly built branch mileage, as is the case with the Southern system. The Louisville & Nashville and the Queen & Crescent Route both serve the same territory in large measure; yet the former has an intricate network of branches on its trunk, while the latter is a single direct through line, with almost no feeders. Or again one system may be held together by leases, while another actually owns its roads in fee simple. This feature undoubtedly helps to explain the high capitalization of the New Haven system, by comparison with its neighbor, the Boston & Maine. And then finally, of course, full details are needed as to the relative worth of the rolling stock. Many thousands of dollars per mile of line, more or less, may profitably be invested in this way without seemingly affecting operation. The difference between two systems will appear only when the items of expenditure for rental of equipment or interest on car trust securities are compared.

The foregoing comments upon the intricacies of railway finance suffice to show why new modes of calculation of net capitalization are imperatively demanded. The customary method of figuring mileage capitalization is to divide the sum of stock and funded debt issued by the miles of line. Such a calculation considers the finances only of the parent company. It was suitable to old-fashioned, simple railroad organization. But in a complicated group of owned, leased and controlled roads it fails to give a true representation of the state of affairs. Nor are the figures for one road in any wise fairly comparable with those of another, differently organized financially. How great a difference this present mode of determining capitalization may be from the one customarily employed may be illustrated by the case of the Boston & Maine Railroad Company. Its nominal capital stock and funded debt, as of June 30, 1906, amounted to $60,280,000, or $26,000 per mile for 2,287 miles of line operated directly. Our figure for the entire group with a mileage of 3,369 in the Boston & Maine system was $55,000 per mile of line. This wide difference of upward of 100 per cent. is due to the fact that our calculation comprehends the capitalization of each separate unit in the system, such as the Boston & Lowell, capitalized at $40,000; the Maine Central at $42,000, and the Fitchburg Railroad, capitalized at $105,000 per mile. From a purely private point of view, the aspect of the investor in shares of the parent Boston & Maine Company, the capitalization of $26,000 per mile is the basis of all calculations; inasmuch as the larger part of the system is held together by guaranteed rentals. The capitalization of the present company is based upon the surplus earnings of these lines above their fixed rents. From the standpoint of the public, which bears the aggregate burden of the rates, the figure of $55,000 is the significant one. The Boston & Maine in its individual capitalization as a parent company has provided for only 51 per cent. of the capital stock of the Maine Central, this being the proportion which it owns. But the shipping and traveling public are concerned with the entire capitalization of both the parent and subsidiary lines, allowance for duplication being properly made. Yet this method of calculation does not always enhance capitalization, as in the preceding instance. Sometimes it may actually reduce it. This is true of the Northwestern system. This new mode of computation reduces its average capitalization by about $3,500 per mile. There can be no doubt, however, that substantially different results follow from this mode of computation; and it is believed that these results, if compiled with great care for each company, especially if market price for securities instead of par could be used, would be entitled to greater weight for all purposes of comparison of road with road, or in connection with the discussion of overcapitalization or rate regulation than those currently quoted.

Per Mile of Line.

System June 30, 1906	Mileage	Net Capitaliz'n	Gross Earnings From Operation	Net Earnings From Operation	Charges, Taxes and Guaranteed Rentals	Ton Miles Freight Traffic (Density)	Earnings Per Train Mile	Net Earnings to Net Capitaliz'n.	Charges, Etc., to Net Earnings
St. Paul	6,961	$30,800	$8,000	$2,760	$850	670,000	$2.42	8.9	30.4
North Western	7,453	31,000	8,500	2,860	860	1,094,000	2.32	9.2	30
Mo. Pacific	6,275	33,700	7,100	2,270	1,830	740,000	2.32	6.7	80
Illinois Central	5,698	39,400	10,580	3,530	1,620	[1,408,000]	[1.96]	9	46
Seaboard	2,611	40,700	6,050	1,630	1,200	368,000	2.17	4	73
Southern	7,515	47,500	7,274	1,840	1,510	527,000	1.90	3.8	82
Rock Island	14,200	50,000	7,380	2,500	1,860	600,000	[2.28]	5	74
Atchison	8,433	50,600	9,370	3,360	1,260	693,000	2.87	6.6	37
Boston & Maine	3,241	55,000	14,600	3,820	3,070		[1.85]	6.9	80
Great Northern	5,196	57,600	8,900	4,100	1,770	835,000	4.25	7.1	43
Southern Pacific	9,459	58,600	11,800			784,000	3.29		
Union Pacific	6,422	64,800	11,200	6,500	1,400	[1,203,000]	[3.84]	10	21
Northern Pacific	6,223	65,000	9,830	4,800	1,150	971,000	3.09	7.4	24
D. & R. G.	2,477	82,000	7,900	3,170		435,000	2.85	3.8	
N. Y. Central	8,221	84,500	22,700	5,550	3,500	[2,545,000]	[2.45]	6.5	63
Pennsylvania	10,754	86,400	22,000	7,200	3,050	[4,742,000]	[3.14]	8.3	42
Norfolk & Western	1,853	88,000	15,300	5,300	1,800	2,704,000		6.0	34
Great Western	1,475	90,000	7,500	2,500	1,200	1,065,000		2.8	48
Wabash	2,517	92,500	10,000	3,240	3,040	1,180,000	1.59	3.5	93
New Haven	2,603	96,600	23,100	8,400	4,000	990,000	3.40	8.7	47
Baltimore & Ohio	4,029	106,000	19,200	7,700	3,300	2,660,000	2.35	7.2	43
D., L. & W.	957	115,000	34,400	17,700	11,600	1,568,000		15.4	65
Reading	2,126	169,000	19,000	7,000	4,500	1,587,000	2.30	4.1	64
Erie	2,150	169,000	22,060	6,680	5,250	2,764,000	2.71	3.9	78
United States	216,804	58,050	10,300	3,500	1,750	982,000	2.07	6	50

The next step in our analysis is to compare earning power with true capitalization. A comparative exhibit of this sort is afforded by our second set of figures. The mileage in each system is approximately the same as in the preceding table of net capitalization, from which, in fact, the results as to capitalization are brought forward. This purports to be no more than a rough calculation, for the technical difficulties of exact comparison are very great. The results are, of course, as of June 30, 1906, that being the date of the official statistics used in computing capitalization. Many important changes in railway grouping have since occurred, such, for example, as the readjustment of railway investments in the anthracite coal roads, the development of later Union Pacific and New Haven finance, and the reorganizations of 1907. Moreover, even for the given date, it is extremely difficult to compute results for the systems exactly as classified in the official Federal report used for computing net capitalization. Many roads within a system, held together by ownership of a bare majority of stock, report financial results separately. It has been necessary to piece these together. But the larger units have alone been taken into account.

An attempt has, however, been made to piece together a sufficiently large proportion of each "system" to render the returns fairly representative. Thus, by combining the operating returns

for the Pennsylvania Railroad, the Pennsylvania Company, the Philadelphia, Wilmington & Baltimore, the West Jersey & Sea Shore, the Northern Central and the Long Island railways, a sufficient proportion of all the Pennsylvania system's mileage is comprehended to permit grafting the results upon the figures of net capitalization derived from the preceding table. Equally difficult is it to secure entire uniformity because of the different forms of accounting employed. Most of these figures have been taken from the Manual of Statistics for 1907, supplemented by examination of individual reports. The greatest ambiguity is in the treatment of fixed charges. The practice respecting sinking funds is quite varied. The North Western regularly credits its income from "Omaha" stock against fixed charges, thus reducing them substantially. In this table taxes are included with fixed charges for purposes of comparison. Nor has it always been possible to treat rentals uniformly; but in the main it would appear that guaranteed rentals like those on the Boston & Maine system are included with fixed charges; while rentals contingent upon earnings, as in the Pennsylvania group, are excluded from the statement of fixed charges, as given. It should also be noted that these figures for earnings are those reported for parent companies. They are not compiled, as were the data concerning capitalization by aggregating the precise returns for each separate corporate unit. Jointly held terminal companies are seldom included in statements of the great systems. Undisclosed profits or losses may readily disappear in intercorporate accounting within each system. It has recently been charged that the Illinois Central has not made clear its obligations assumed in the guarantee of bonds of the Yazoo & Mississippi Valley road. It is probable, however, that the balance is heavily on the profit side; in other words, that more surplus earnings are left undivided than losses are concealed. As for the figures of traffic density, weighted averages of the component parts of each system have been computed when not reported for the system as a whole. The principal exceptions are the Pennsylvania, New York Central and Union Pacific, where only parent company results are given.

In comparing net earnings with capitalization, how does one know that the properties are being uniformly maintained out of expenditures for operation? May not some be deteriorating through postponement of proper maintenance, while others are being steadily improved by a liberal policy in this regard? A case in point is the experience of the Chicago & Alton under Hawley management. This road initiated 4 per cent. dividends in 1907, showing them, however, as barely earned. In the succeeding two years expenditures for maintenance of way dropped from $3,120 per mile of line to $2,494 in 1909. Had not the road been thus "skinned," as it appears, the dividends would have been far from earned. The property has not recovered from the recent Harriman piratical raid sufficiently to render such tactics safe. Yet a bold comparison of expenditures for maintenance of way and equipment per mile of line would be unfair. The need for such outlay varies more or less in proportion to the load of utilization. Maintenance, if compared, should be given in terms of density of traffic. Thus in 1907 the Union Pacific expended $3,175 per mile of line for maintenance of way; the North Western expended only $2,333. But the density of traffic of the Union Pacific road is 60 per cent. greater. Maintenance of way expenditure in terms of 100,000 ton-miles of freight density are only $268 for the Union Pacific, against $324 for the North Western, per mile of line. Despite appearances, due regard being paid to density of traffic, the North Western is pursuing the more conservative policy of the two.

The principal conclusion supported by this second table is that, as a rule, the net return upon the net capitalization of all American railways as a unit, after settlement of fixed charges, is far from excessive. From an average of 6 per cent. for the United States, this balance for interest and dividends ranges from less than 3 per cent. on the Chicago Great Western to 10 per cent. on the Union Pacific. The D., L. & W., with net earnings of 15 per cent., is abnormal, as already noted. Of course, the actual rate of return on the capital stock of parent companies is higher than this, they being the residuary legatees of profits after interest on bonds and subsidiary companies are cared for. But even with this allowance the rate appears not to be excessive, as inspection of the last column demonstrates. For comparison the returns for other countries are as follows:

	Capitalization Per Mile of Line	Net Earnings Per Mile of Line	Per Cent. Net Earnings to Capitalization
Great Britain, '06.....	$267,000	$9,380	3.45
France (6 Co.'s.), '04....	133,000	6,500	4.9
Germany, '99.....	64,200	4,680	7.28
United States, '06.....	58,050	3,500	8.

This low rate of return for American railways, as a whole, being expressive of a ratio between two variables, may be due to either one of two facts. Either the earnings are unduly low, or the capitalization is too high. As to the second assumption, whatever may have been true of conditions a generation ago, it certainly does not appear that at present the capitalization is unduly high, as measured in terms of cost or physical value. And this comparison with leading European states appears to support this view, when our railway net is considered as a whole. For our capitalization per mile of line is distinctly the smallest in the list. But, on the other hand, when we take the average for the United States and line up individual companies alongside it, the ill effects of excessive capitalization in specific instances at once appear. This comparison may perhaps best be effected by putting our railway systems into typical groups, ranging in order from what may be termed financially conservative systems to unwisely ordered ones. At this point, however, it should carefully be noted that these comparisons should not always be regarded as indictments of existing managements. Nowhere than in the field of corporate finance is it clearer that the evil men do lives after them. The notorious past of some of these companies, like the Erie under Jim Fisk and Jay Gould, or the Chicago & Alton, as reorganized by the late Mr. Harriman, must be held accountable for their present financial hardships in a large measure. The difficult task of rescuing these properties from their slough of overcapitalization requires talent of a high order coupled with infinite patience.

Reasonable capitalization, from one point of view, being entirely a matter of relativity between two variables, it makes little difference whether low capitalization and modest earnings or high capitalization and rich returns be coupled up. But in either case it is imperative that the burden of fixed charges be low in order that the balance may be satisfactory. The first two groups of properties therefore at the head of the list of conservatively financed roads are both characterized by fixed charges of from $1,000 to $3,000 per mile; that is to say, by fixed charges absorbing less than half and ordinarily not more than one-quarter or one-third of net earnings from operation. The balance remaining, therefore, is sure to be satisfactory; that is to say, from 4 to 8 per cent. on net capitalization. But the marked contrast between these two groups in the first class is that one is capitalized between $30,000 and $50,000 per mile, with earnings per mile centering about $3,000; while the other is capitalized very much higher, at $50,000 to $100,000 per mile. (Baltimore & Ohio alone exceeding that figure, but its net earnings are correspondingly large, viz., from $4,000 to $7,000 for the same unit.) This difference in earning power is, of course, largely the result of differences in density. The granger roads all have less than 1,000,000 ton-miles of freight traffic per mile; while the second group rises to 5,000,000 ton-miles per mile of line. (The Great Northern alone has a density more closely allied to that of the granger roads. Its profits result from phenomenal economy in operation.) The important point is that the relativity between the two variables is such that the net earnings stand to capitalization at between 6 and 10 per cent; and that the fixed charges to be deducted are relatively moderate in amount.

Fixed charges, it will be noted, on the Delaware, Lackawanna & Western are enormous—$11,600 per mile of line. This is more than twice the fixed charges on the Erie. But earnings are likewise so phenomenal, more than twice those of the Pennsylvania or New Haven systems, that, while fixed charges absorb two-thirds of net revenue, a substantial balance remains. This

balance focussed on the small capital of the parent company explains the phenomenally high market price of its securities.

	Capitalization Per Mile	Per Cent. Net to Capitaliz'n.	Per Cent. Fixed Charges to Net Earnings
Class I.—Group A:			
Northwestern	$31,000	9.2	30
St. Paul	30,800	8.9	30.4
Illinois Central	39,400	9	46
Atchison	50,600	6.6	37
Group B:			
Great Northern	$57,600	7.1	43
Union Pacific	64,800	10	21
Northern Pacific	65,000	7.4	24
Norfolk & Western	88,000	6.2	34
Pennsylvania	86,400	8.3	42

The prejudicial effect of a heavy burden of fixed charges may next be demonstrated by segregating in a second class the companies thus characterized. But at the same time the systems in this class all enjoy ample or high net earnings. In other words, while heavily burdened, they possess sufficient earning power in normal times to support it. The real test of this group is applied in times of depression. Under these circumstances the stability of the surplus after fixed charges is apt to be endangered. By way of contrast, the Pennsylvania, in the preceding group of roads with low fixed charges, having financed its new improvements by stock issues instead of bonds, witnessed during the depression of 1908 a decline of gross earnings of $52,400,000, while reducing its net earnings after fixed charges by only $2,971,000. The Union Pacific, having followed the same policy, is equally impregnable financially.

	Capitalization Per Mile	Per Cent. Net to Capitaliz'n.	Per Cent. Fixed Charges to Net Earnings
Class II.			
Boston & Maine	$55,000	6.9	80
New York Central	84,500	6.5	63
New Haven	96,600	8.7	47
Baltimore & Ohio	106,000	7.2	43
Reading	169,000	4.1	64

Among these five companies, fixed charges (including fixed rentals) consume between $3,000 and $4,000 per mile; that is to say, from 40 to 80 per cent. of net earnings. This is a burden of fixed charges approximately twice as great as in the first class. But, on the other hand, the rate of their earnings, sometimes attaining nearly $8,000 per mile, a comfortable balance usually remains, nevertheless. Systems in this class are commonly so financed that this balance after fixed charges and rentals, while seemingly small, is focussed upon a parent company, in itself modestly capitalized. The result is that a normal rate of return is thereby established. This point has already been illustrated by the case of the Boston & Maine. But the peculiarity of several of these companies is the fluctuating nature of this rate of return. Alternately fat and lean balances follow changes in industrial property. On the other hand, the fixity of the return upon much of the capitalization concentrates the growth for future years upon a small basis of capital stock. The financial potentialities of some of these companies may be very great. Yet for the present they do not afford the guarantee of steady returns, possessed by the groups of roads in the first class, as fortified by the advantage of low fixed charges.

Most of the companies in this group, it should be observed, are financially strong by reason of heavy density of traffic, high rates or both, giving them an ample earning power per mile of line. But in the case of other companies not in the enjoyment of such high earnings, the disadvantage of proportionately heavy fixed charges is very clear. Nor is it possible to overcome this disability readily even by maintaining the total capitalization upon a low basis. This may be shown by the following group of roads, assignable to a third general class. These are capitalized

	Capitalization Per Mile	Per Cent. Net to Capitaliz'n.	Per Cent. Fixed Charges to Net Earnings
Class III.			
Seaboard	$40,700	4	73
Missouri Pacific	33,700	6.7	80

at less than $50,000 per mile, with earnings proportionately low, but they are at the same time saddled with fixed charges which absorb three-quarters or more of their net earnings. Low earning power—whether resulting from low density as on the Seaboard, or from low rates applied to a fair density of traffic as on the Missouri Pacific—and high fixed charges are a dangerous combination, even with modest capitalization.

Railways in the fourth class, as respects their financing, are characterized by abnormally high capitalization, ranging from about $50,000 per mile of line on the Rock Island system to over three times that figure on the Erie Railroad. This absolutely high capitalization is not by itself their main claim to distinction; inasmuch as several properties in the preceding class were capitalized above $100,000 per mile. The prime characteristic is a distorted relativity between capitalization and earning power. But it must be firmly grasped that it is this relativity and not the absolute volume of capital outstanding which is of moment. The Reading, capitalized nearly thrice as heavily as the Southern and with fixed charges equally greater, earns $7,000 net per mile, as compared with $1,800 on the Southern. But in both cases capitalization is so huge by comparison with earnings that a negligible balance remains for distribution. Net earnings from operation to meet fixed charges usually in this class of roads yield less than 4 per cent. on capitalization. Obviously not much balance can be expected after fixed charges are paid out of this. At this point, however, one may note a further subdivision of the roads in this fourth class. The first group (A), heavily

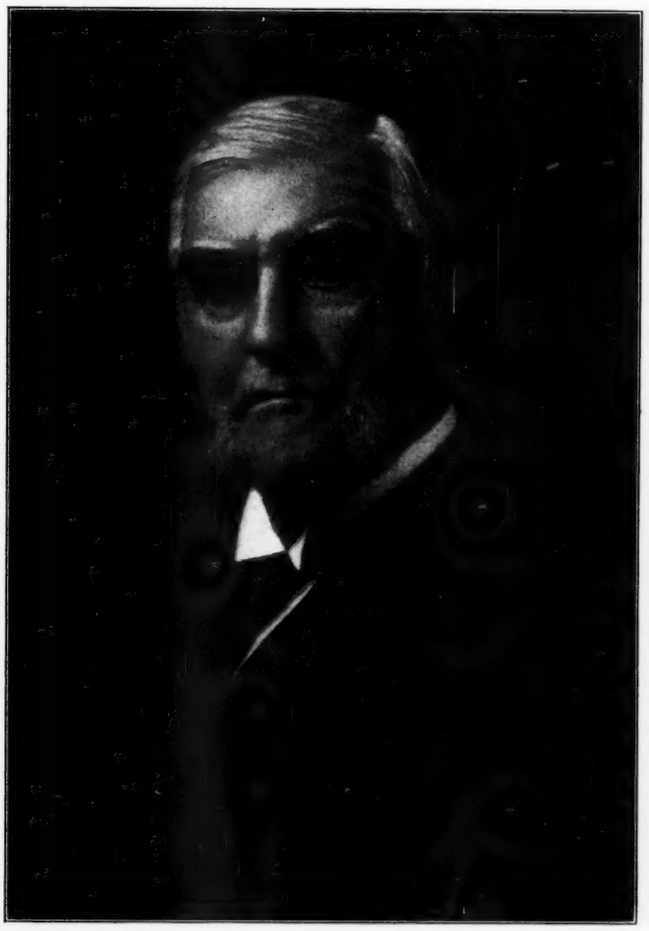
	Capitalization Per Mile	Per Cent. Net to Capitaliz'n.	Per Cent. Fixed Charges to Net Earnings
Class IV.—Group A:			
Chicago Great Western	$90,000	2.8	48
Rock Island	50,000	5	74
Group B:			
Southern	$47,500	3.8	82
Wabash	92,500	3.5	93
Reading	169,000	4.1	64
Erie	169,000	3.9	78

capitalized in proportion to earning power, is somewhat more favored in respect of fixed expenses; less than half of net being devoted thereto on the Chicago Great Western. Strongly contrasted therewith is another group (B), even more heavily capitalized both absolutely and in terms of revenue power; and, moreover, utterly swamped by fixed charges, which absorb as much as nine-tenths of the relatively scanty income. All the roads in this group (B), whether with high or low fixed charges, may assuredly be characterized as overcapitalized from every point of view. Entirely apart from every consideration of value of the physical property, even the criterion of reasonable earning power in relation to capital issues, utterly fails. Indefensible financing is clearly expressed in the market value of their junior securities. In most instances the causes of financial impotence lie buried in the past. Present managements appear to be striving manfully to rescue them from collapse. But the difficulty is enormous. Factors which on conservatively financed roads make for prosperity, on roads of this class become almost unsupportable burdens. Thus, even growth of traffic, entailing as it does the necessity for heavy capital outlay, brings no relief. For, there being no adequate surplus earnings over fixed charges to draw upon, there is no recourse except to issue more securities. The one road in this group somewhat more favored than the rest is the Reading. Product of scandal and fraud of a generation ago, it is nevertheless true that its tangible assets of undeveloped coal lands are of great value. Its potential strength has, however, always been its actual weakness. Staggering for a generation under a burden of debt incurred in order to acquire a future monopoly of this indispensable commodity, its general traffic, together with its large share of the hard coal trade conducted at monopoly prices, seem likely to carry it on to a successful issue. Time, which with its ever-recurring interest periods so preys upon its fellows in this financial class, must ultimately prove its salvation. But in the meantime the public is taxed to pay interest upon the value of the coal supply of the indefinite future.

The foregoing analysis of the finances of individual systems has, it is hoped, firmly established the fact that reasonable capitalization is entirely an affair of proportionality. Mere absolute figures can afford little index as to financial status, either from the point of view of the investor or the public. A modest capital issue per mile of line may represent an improper fiscal policy; while sound warrant for heavy capitalization may be at hand.

MARVIN HUGHITT.

The retirement last week of Marvin Hughitt from the presidency of the Chicago & North Western and his election as chairman of the board of directors was an interesting event in the history of railways in this country. Mr. Hughitt was almost, if not quite, the dean of the presidents of large American railways. He became president of the Chicago & North Western in 1887. Sir William C. Van Horne did not become president of the Canadian Pacific until 1888. E. P. Ripley did not become president of the Santa Fe until 1896. Alexander J. Cassatt was not elected president of the Pennsylvania Railroad until 1899. James J. Hill became president of the St. Paul, Minneapolis & Manitoba in 1883 (four years before Mr. Hughitt was elected president of the North Western) and was elected president of the Great Northern in 1889; but he retired some time since from the duties of the presidency to those of the chairmanship. The only man who is now president of a large American railway and who was president before Mr. Hughitt was elected president of the North Western, it is believed, is Milton H. Smith of the Louisville & Nashville. But Mr. Smith's service has not been continuous. He was president of the Louisville & Nashville from 1884 to 1886, was vice-president from 1886 to 1891, and was then again made president.



Marvin Hughitt.

Mr. Hughitt's resignation to assume the less active, but hardly less responsible, duties of the chairmanship of the board is in accordance with a precedent which has been set within very recent years by a number of railway presidents, including James J. Hill, George B. Harris, of the Burlington, and Oscar G. Murray, of the Baltimore & Ohio. W. H. Newman also recently retired to a place on the New York Central's board; and J. T. Harahan has confirmed a report that he will soon retire from the presidency of the Illinois Central to become chairman of its board. The changes in the presidencies of large railways have come so fast lately that it is evident the younger generation will soon be responsible for their management.

Mr. Hughitt's career stands out as one of the most successful in the annals of the railways of this country. He will always be recognized as one of the most conscientious and able of railway managers. When he became president of the Chicago & North Western in 1887 it operated a total mileage of less than 4,000 miles. This did not include the Chicago, St. Paul, Minneapolis & Omaha, which in 1887 had a mileage of 1,340 miles. Mr. Hughitt was president of the latter road for five years before 1887. In 1910 the North Western operates 7,629 miles, and the Chicago, St. Paul, Minneapolis & Omaha, 1,739 miles. Mr. Hughitt retired from the presidency of the Chicago, St. Paul, Minneapolis & Omaha two years ago and was succeeded by William A. Gardner, who now succeeds him on the North Western.

The increase in the mileage of the North Western system conveys but a faint idea of the development which took place in the property under Mr. Hughitt's active management. He is sometimes referred to as a "conservative" railway manager. A better statement would be, in the parlance of modern politics, that he has been a "conservative progressive." There has been nothing sensational about his methods, but they have been constantly progressive, and in the very best sense of that word. He has apparently had two ideals. One has been to make such extensions and improvements as would develop the maximum traffic and enable it to be handled with the maximum economy, thereby making the property as profitable as possible to those who invested their money in it; and the other has been to give the public the very best service that it was possible to render. Perhaps the latter ideal occupied the foremost place in his mind. In any event he has succeeded in realizing both ideals in a pre-eminent degree. His conservatism is illustrated by the fact that he never allowed himself to be tempted into building an extension to the Pacific coast. The North Western for years has had very satisfactory through traffic arrangements with the Union Pacific and other Harriman lines. It has delivered a good deal of business to them, and they have delivered a good deal to it. If it had built to the coast it would have become a competitor of, instead of a connection with, the Harriman lines, and it is questionable if it would have been as profitable for it to have entered into the Pacific coast competition as it has been for it to maintain its present traffic arrangements. On the other hand, Mr. Hughitt has shown an unflagging perseverance in building extensions and branches everywhere in the North Western's immediate territory. A consequence of this steady, but never sensational, development has been that the road has never been to any considerable extent burdened by unprofitable branches. Hardly a railway in America has a finer dividend record. It has never failed to pay a dividend in any year since 1878. From 1887 (when Mr. Hughitt became president) to 1894, it paid 6 per cent. on its common stock. In 1895 it paid 4 per cent.; from 1896 to 1899 it paid 5 per cent.; in 1900 it paid 6 per cent., and since then it has regularly paid 7 per cent. Its ability always to meet its obligations to its bondholders and stockholders has been due both to its conservative but steady development and to the fact that its securities have never been the subject of manipulation.

While the road has been constantly strengthened by strategic extensions to every part of its territory, millions have been spent both from earnings and from capital to put it in fine physical condition. It has been double-tracked from Chicago to Omaha, from Chicago to Milwaukee and most of the way from Chicago to St. Paul and Minneapolis. Its equipment, roadway and structures have been kept in excellent condition. It has an exceptional mileage of block signals, and is to-day universally recognized, mainly as a result of Mr. Hughitt's management of it, as one of the best railways in the world.

Its service to the public has been such as only such a railway is able to give. When the Wisconsin Railway Commission finished its hearing on the passenger-rate question about three and a half years ago, one of the commissioners remarked that the only criticism he had to make of the North Western was that the service it rendered was too good; that it gave the public really more than the public could in reason ask. The large suburban business of the company at Chicago has been a thing in which Mr. Hughitt has taken special interest and pride.

Some time ago the Wells street station in Chicago became inadequate properly to take care of the 45,000 or more people who pass through it daily. It was in keeping with Mr. Hughitt's policy that, as a new station was needed, one should be built which should gratify the civic pride of the people of Chicago and should serve the road's needs for years to come. The new North Western passenger station and terminals, which are nearing completion, will, it is estimated, have a capacity for handling 250,000 people a day, and are a splendid monument to Mr. Hughitt's civic spirit. The inception of the station, the planning for it, and the carrying out of the plans were all his.

Mr. Hughitt's disposition to give the public a square deal, and even more than a square deal, has manifested itself in innumerable ways. It is not generally known that he was one of the very small minority of railway presidents who five years ago favored President Roosevelt's plan to give the Interstate Commerce Commission the power to substitute reasonable rates for those which it found unreasonable.

While he has been a man of many and important works he has been and still is a man of very few words. Anybody who has any business with him can see him at his office, and is received and treated with the courtesy traditionally characteristic of a "gentleman of the old school." But as Falstaff said of himself that he not only was witty, but was the cause of wit in others, so it might be said of Mr. Hughitt that he is not only brief, but he is the cause of brevity in others. When he has summed up a situation in his crisp, concise way, there is not much more to be said.

He does not entirely dislike publicity, but he hates to have it overdone. When he has allowed himself to be quoted in the press his statements always have been very brief, and the consequence is that while his name is known to people throughout the country, his views on public questions, including even regulation of railways, are not widely known.

Mr. Hughitt says emphatically that while he has retired from the presidency of the North Western he has not retired from active work, but that the position to which he has been elected is one with rather comprehensive duties and authority, and that he expects to devote himself to them in much the same way that he has devoted himself to the duties of president.

Mr. Hughitt was borne in Genoa, N. Y. He began railway work in 1856, with the St. Louis, Alton & Chicago, now the Chicago & Alton, as superintendent of telegraph and trainmaster. In 1862 he became a superintendent on the Southern division of the Illinois Central. While he was holding this position the government called on the road to move a large detachment of troops at a time when traffic was heavy. Mr. Hughitt himself took his place at the despatcher's key and performed the task without interference to traffic. Immediately after the troops had been moved, the government ordered that they be transferred back from whence they had come. Although he had been at the key 36 hours Mr. Hughitt stayed at it for 36 hours more, and finished the job. Soon after he was appointed general superintendent of the Illinois Central. In 1870 he went with the Chicago, Milwaukee & St. Paul as assistant general manager. The next year he became general maanger of Pullman's Palace Car Company, and in 1872 was appointed general superintendent of the Chicago & North Western. He became general manager in 1876, vice-president and general manager in 1880 and has been president since 1887.

What is perhaps his strongest characteristic is one which it is rather hard to formulate. Reserve and self-reliance each come close to expressing it. He does not like to act with other people or other companies in the management of his own business. This independence and confidence has no tinge of obstinacy. While quick in his decisions, he is equally quick to see the value of the other man's opinion. This quality of his has kept the North Western independent and free from any agreement binding its policy or management. Its contracts with the Harriman Lines are purely traffic agreements, and its financial relation to the New York Central is not an inter-company relation, but is only owing to the fact that the Vanderbilt family have individual holdings in the stock of the North Western.

The reserve he has in his official work is also evident in his personal relations with other men. He does not gossip, particularly about other people and other railways; he is always a diplomat. Somehow he fixes in his own mind the status of every one with whom he comes in contact; and if the man is worthy of trust, he goes to almost any length in trusting him. He does not make mistakes in these judgments. This personal reserve adds dignity to his attractive personality, and he is the more popular for it.

The list of offices he has filled shows only operating positions, but he was a general superintendent at a time when every department of a road reported to that officer; so he had opportunities, not now given to operating officers, of learning the details of traffic and other departments of railroading. That he took full advantage of these opportunities is sure, for he knows how to concentrate. He goes right to the bottom of a subject, getting into his hands everything that pertains to it, draws his conclusions or takes action, and then throws the work back over his shoulder and is ready for something else.

WILLIAM A. GARDNER.

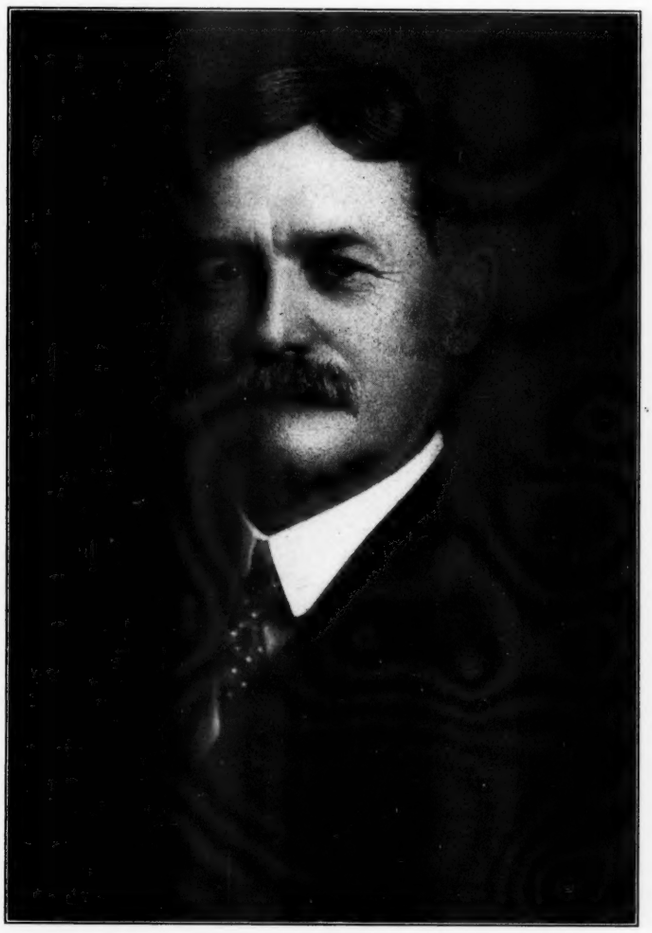
Wiliiam A. Gardner, vice-president of the Chicago & North Western in charge of operation, has been elected to succeed Marvin Hughitt as president. Mr. Gardner already was president of the Chicago, St. Paul, Minneapolis & Omaha. He now becomes the administrative head of the entire North Western system. Mr. Gardner's promotion marks the achievement of an ambition of many years. He has long ranked among the very leading railway operating executives of the United States. It is understood that he has had inviting offers to leave the North Western, by the acceptance of which he could have become the president of a large railway system before this. But all of his railway career, except a short part of it when he was a boy telegraph operator, has been on the North Western. He has seen it grow from a system of 2,000 miles to one, including its subsidiaries, of almost 9,500 miles. He has risen step by step through all grades of the operating department. He knows the road as perhaps no other man except Mr. Hughitt knows it. He knows and loves the North Western and the North Western knows and loves him. Not unnaturally, therefore, he preferred to stay and take his chances with it.

No one who knows him or is familiar with his career will question that he will at once step into the front rank of American railway presidents. His life has been spent in the operating department. But he is much more than an operating man. He is a many-sided man of affairs—and many-sided men are the kind needed to manage American railways under present conditions. It used to be that if a railway president were an honest man and an able and experienced executive, he had all the qualifications needed. His executive ability and experience made sure that the property would be well operated; his honesty made sure that the stockholders would receive all to which they were entitled. That day is past. The modern railway president, in order to make a first-rate success, must be not only an honest and able executive but also a student and a diplomatist—a railway statesman. Mr. Gardner measures up to these requirements.

That he is a diplomat is shown by the fact that he is per-

sonally extremely popular with newspaper men, business men and public men who know him, and also with the officers and employees of the North Western, from the top to the bottom, although he has always courageously and vigorously defended the right of the railways to the same sort of public protection that is given to other commercial concerns, and has been a firm disciplinarian in dealing with all his subordinates. The public likes him because, while vigorously defending the rights of the railways, he has always frankly conceded and tried to give to the public everything to which it is entitled. The employees like him because, while a firm disciplinarian, he is a just and kindly one; and every man feels he can get from him a square deal. "I have always tried to be a good subordinate," he said in a newspaper interview after his election as president. A good subordinate is pretty apt to have good subordinates. Then, Mr. Gardner has an uncommonly attractive personality. He can refuse a request from a community or from employees and leave a better feeling than many men would leave if they granted it.

He is a good student, both of books and of men. He was one of the earliest among railway officers to recognize the fact that the roads must submit to reasonable regulation. He has been one of those who have seen most clearly that in order to create a more favorable public sentiment toward the roads it is as necessary to reduce the number of things in railway administration that are not defensible as to defend skilfully and courageously those things that are defensible. His utterances on public questions have been infrequent, but they always have been effective. He doesn't pose as an after-dinner speaker, but there are few busy railway men who can make as witty and entertaining a post-prandial talk. His testimony in the recent hearings before the Interstate Commerce Commission at Chicago in the rate advance cases was an extraordinarily strong statement of the case of the railways on both economic and practical grounds. No man could have given it who had not been a sound student as well as a hard-working and keen-thinking railway executive. It was not only a strong argument, but it was illuminated by numerous epigrams which epitomized the railway case in a nutshell. When counsel who was cross-examining him called attention to the North Western's large surplus as evidence that its rates were high enough, he replied: "The surplus expresses an efficient administration as well as a remunerative rate. If the position were swept away that efficient administration produces a surplus as well as high rates, there would be no incentive for efficient administration." When reference was made to the fact that the railway exercises the right of eminent domain and it was contended that for this reason the road's earnings may properly be held down to a lower basis than those of a commercial concern, he replied: "The exercise of the right of eminent domain, while it may give the power to regulate railways, does not render the North Western immune from the ordinary commercial rules when we undertake to borrow money." He was asked how the commission was to know how long a road would go on increasing the amount of improvements which it regarded as maintenance, and replied, "The physical condition of a railway is like a case of typhoid fever; it never stands still, but always gets better or worse." "If prospective business demands greater expenditures for up-keep, we shall have to make them."



William A. Gardner.

As the operating executive of the North Western, it has been his duty largely to carry out Mr. Hughitt's policy of developing the strategic possibilities of the road and the possibilities of better and more economical operation, and at the same time, in co-operation with the traffic department, to give the public the best practicable service. How well he has done his part is indicated by the present excellent physical condition of the road, the service that it gives and its financial results. Perhaps no other railway management has learned better the lesson of the blockade of traffic four years ago than did the management of the North Western. The thing most needed to enable the railways better to handle their growing traffic is improvement in terminals; and during the last few years very extensive enlargements and improvements have been made by the North Western in its various terminals, particularly in those at Milwaukee and Chicago. In both these cities it has built outer belt lines to take as much of its through traffic as possible outside of the city limits. It has made and is still making large additions to, and improvements in, yard facilities, particularly at Chicago.

Mr. Gardner is only 51 years old. He was born at Gardner, Ill., and began railway work in 1872 as a telegraph operator on the Chicago & Alton at Lemont, Ill. Six years later he went to the Chicago & North Western as a clerk and was later made operator in the office of the superintendent. For five years from 1885 he was assistant superintendent of the Wisconsin division and was then made superintendent. He was appointed assistant general superintendent in October, 1896, and three years later was made general manager. In January, 1906, he was elected vice-president, and became president also of the Chicago, St. Paul, Minneapolis & Omaha in October, 1907.

He is a slender, gray man of a nervous temperament. While, perhaps, there cannot be said to be very much iron in his constitution, there is a deal of steel in it, and he knows how to take care of himself, which is often better than having an "iron constitution." He is a fast, systematic, tireless worker, and under him the North Western will have a public-spirited, efficient, progressive administration.

The Chilean Government has 1,677 miles of railway completed and 1,346 miles under construction, while private interests have 1,920 miles completed and 106 under construction.

BRIDGE AND BUILDING CONVENTION.

The twentieth annual convention of the American Railway Bridge and Building Association was held in Denver, Colo., October 18 to 20. The following subjects were taken up in committee reports:

PROTECTING EMBANKMENTS AGAINST CURRENTS.

E. L. Loftus (Q. & C.), Chairman of Committee.—In many instances serious washouts occur because ordinary trestles have been built where there should have been larger clear waterways. In well-driven pile bent trestles the earth may be scoured from around the piling, and cause the bridge either to be washed away, or the flow of water retarded and a washout occur at the approach of the trestle or other point, and frequently rise to flow entirely over the roadbed on either side of the structure. A stream may overflow and fill in the land on the upper side of the road, and if this condition is allowed to continue a few years it may become necessary to raise the track in that vicinity, particularly if the soil is of a sandy nature. It is often the case that culverts are placed under roadbed sufficiently large to carry the water, but they become choked with drift and the fill is washed out. Such danger can be obviated by making the opening larger, and, of course, any brush or obstruction at or near the mouths of culverts or trestles should be removed as often as such accumulations occur. When several panels of a trestle are washed out and it is desired to pass trains quickly, a good plan is to point piles and work them into the soil with cant hooks. When all the piles have been set and braced, place sash near the grade and jack them in. After all of the bents have been placed in this manner, with the track standing sufficiently high to allow for settling, run empty cars over the structure to settle it, and then block up. Then run over the loads, after which allow the engines to cross, but the first engine should not move faster than ten miles per hour. Work done in this manner will require close attention until piles can be driven. Frequently such a temporary structure can be built and traffic resumed before a pile driver can reach the defective point. The piles for this temporary structure can sometimes be cut from woods near the washout.

When a low fill is washed out and the track is not turned over, it can readily be lined back to its original bed without taking it apart; but, if the track is turned over it is cheaper to first remove the ties from the rail. In that event have the ties placed on the roadbed and the rail moved to one side by lifting it with a large force and dropping it upon the ties without uncoupling.

Where the overflow occurs frequently the track should be raised above the danger line. Until this can be done the trestle should be securely anchored and the track ballasted with heavy stone or slag. If it is not possible to secure either kind of ballast, a Bermuda sod is very good. The track also should be anchored at such points. This can be done by driving piles alternately 30 ft. apart. A very cheap and effective way is to bore holes near the ends of the ties alternately 30 ft. apart, and drive a 1¼-in. bolt into the roadbed, leaving the nut on the upper side. The work of driving can be done from a push car.

A wash or slide may occur at the side of a fill or near the mouth of an opening. Such trouble is frequently due to the manner in which water is permitted to strike the opening, and it can frequently be obviated by changing the current. Should it not be practicable to change the water course where it runs parallel with the roadbed it may be riprapped with heavy stone. In such a case it is a good plan to dig a good foundation 2 ft. below the surface, begin the wall in the ditch and run it up at a slope of 2 to 1. The bottom of the ditch or channel should be floored with heavy stone. Such construction will frequently answer the purpose of a concrete wall and can be built much cheaper. A wall should be used at the ends of all trestles that are subject to wash. In cases where slides have occurred, caused by the current undermining the roadbed, and rock cannot be secured, it is advisable to drive piling at the lower edge of the fill and begin a wall of timber well under ground. Timber of 12-in. x 12-in. size should be placed on the side of the piling nearest the track. This construction will hold securely until the timber decays.

If the earth is of prairie formation it is subject to cracking during dry weather, and when the rains begin the water is absorbed by the cracks, and if the fill is inclined to slide, from any cause, it is more liable to do so after heavy or continuous rainfall. This can be prevented by ballasting and spreading the ballast to the slope from the ends of the ties to the outer edge of the fill. A spread of 4 to 6 in., to retain the moisture, is required. The cracks will not occur where the sun is kept from the earth. Clay or soil of a sandy nature will answer when ballast cannot be obtained. If the fill is of a sandy nature the entire embankment is inclined to wash, but if a spread of 4 in. of cinders be placed on the fill to the edge of the slope, on either side of the ties, the bank will not wash at all on top and not nearly so badly on the sides. The falling water, being absorbed by the cinders, does not flow down the sides of fills with such force.

After the track is placed back on the roadbed and trains begin to move, the pile driver should begin work to replace temporary trestles. Slag or stone should be used to ballast the track and fill up small washes, but if neither stone nor slag is available the next best material with which to surface is clay. The timber used for cribbing should be removed as the track is surfaced.

Where heavy drifts of debris accumulate against a trestle or piers a derrick car with a wrecking crew can be used advantageously; in fact, much more satisfactorily than an engine with block and fall. In removing drift to relieve a structure it is sometimes advisable to use dynamite. Where heavy washing or scouring is being done by the currents and rock is not available, use bags of sand freely, as they can frequently prevent bad breaks in the roadbed.

There are cases where nothing in the way of a temporary trestle would be advisable, and piles must be driven with extension drivers from both directions. Where there is no water to interfere, frame bents should be erected in addition to driving piles; but if plenty of 12 x 12 timber and cross ties are at hand cribbing can be used to advantage. The foundation for cribbing should be built of 12 x 12 timbers or stringers, and placed so as not to interfere with the driving of piles after the traffic has been resumed. This can be quickly and effectively done by building pens. Bents can then be driven between the pens. Again, if there are enough long 12 x 12 pieces, use them after getting the foundation timbers in. This can be done quickly, particularly if the timbers are handled with a derrick car.

When a bridge is found to be settling, due to scour under a pier, it is necessary to drive a bent on either side of the pier as quickly as possible. After getting two bents in on either side and the bridge seated on the timbers and bolted, the trains can be passed with safety until the pier is reset. If it is not possible to drive piles, place false bents until the settling can be stopped, after which drive the piling as directed. Sand bags or stone dropped around the pier frequently prove beneficial.

Should a wash or slide occur on one side of the roadbed, where the bank is still good on the opposite side, and the track cannot be lined over far enough to carry the trains, drive piles eight feet apart near the rail and place a 12 x 12 timber on the piles longitudinally under the rail, to support the track.

The New Orleans & Northeastern has used piles for protecting the embankment along the shore of Lake Pontchartrain against storm waves from the lake. The road was originally on a pile trestle, which was later filled by means of a floating dredge which was operated on the opposite side of trestle from the lake. The material used in filling was composed of shells, sand and marshy soil.

The protecting piles vary in length from 26 to 40 ft., depending on the depth of the water. They are driven about 16 in. centers and on a line 100 ft. from center of the main track. Spacing the piles 16-in. centers allows 4 to 6 in. between the

piles from the surface of the water to the bottom of the water. The storms beat more or less sand and shells between the piles and material filling has resulted. In addition, the space allows the waves to break, and part to go through, whereas a solid wall would cause the waves to fall back and undermine.

The piles are cut off 8 ft. above low water. The driving is done with a "creeper," or land driver, and the overhang is about 18 ft. Every 18 ft. two outside piles are driven and temporarily capped to carry the driver. The cost for driving is 15 cents per foot of pile. Some of these pile butts show "cat faces," or scars, from cutting for turpentine. These are very rich and resinous, and extend down 2 ft. and over, and as the piles in the water are always wet, but little decay has resulted in some fifteen years.

Considerable trouble has been experienced with sliding embankments of the Yazoo Canal along the tracks of the Alabama & Vicksburg, at Vicksburg, Miss. This embankment is about 40 ft. above zero water and apparently has a subdrainage during the low stage of the river, causing the bank to slide. A method for stopping the slide, suggested by an engineer of the United States government, was to drive piling close together in rows, these rows being at least 50 ft. apart; but this method failed. Later it was decided to drive piling in a manner similar to that of foundation work, spacing the piles from 4 to 6 ft. apart in all directions, which stopped the slide altogether. For this work a floating pile driver equipped with a No. 1 Vulcan steam pile hammer was used, weighing 10,500 lbs. The piles were driven with the butt ends down, which offers more resistance and strength at the bottom of the slide where it is most needed. The driving of 40 or 50 piles constituted a day's work.

H. Rettinghouse (C. & N. W.).—Experience on the Missouri river has shown that the driving of piles does not remedy the sliding of embankments, in many cases apparently aggravating the trouble. The only method applicable to such conditions is to use willow mattresses, woven with wire, laid on the bank and extending down into the water, loaded with rock.

William Spencer (C. & N. W.).—The C. & N. W. uses riprap of heavy stones with the cracks filled in with small pieces. The company gets its stone at the quarries at a cost of 40 to 60 cents a ton and it costs 25 cents a ton to place it.

J. M. Staten (C. & O.).—Along the James river we have had considerable trouble with washing out on a fill 2 to 8 ft. high. We remedied this by driving two small chestnut piles about 10 ft. long into the embankment at intervals of 30 ft. The piles were driven near the ends of a tie and directly under it, the tie being removed during the operation. When the piles are in place the tie can be relaid, and a 1-in. hole bored through the tie and into the pile. Into this hole is dropped a ⅞-in. drift bolt from 18 to 24 in. long. The bolt hangs loose, allowing the track to move up and down freely under trains, but is absolutely prevented from moving horizontally, as is the case in a washout. We have experienced no trouble in keeping the track in surface and line.

Mr. Scribner (St. L. S. W.).—We sometimes build a guard cut into the stream to divert the current where a bank is being scoured.

J. N. Penwell (L. E. & W.).—In many places where slight scouring is feared the planting of a few willows or other suitable trees on the bank will form an efficient protection.

Mr. Gumphrey (C., R. I. & P.).—In places where silt overlies quicksand, after a season of high water the quicksand flows out into the stream to fill in the holes left by the scouring of the high water and the bank above the quicksand falls noticeably. In this case surface protection does no good and we have been unable to devise a means of preventing the trouble.

CAST IRON PIPE CULVERTS.

A. A. Page (B. & M.), Chairman of Committee.—A large number of requests for information were sent to the members and 87 replies were received. A large number would take great care in putting in a substantial foundation for the pipe, using old bridge timber for grillage and a cradle, or a concrete foundation the whole length of the pipe, or concrete piers under the joints, thus practically avoiding the danger of pulling apart. Various methods were suggested for repairing broken pipe or joints that were pulled apart, some using rods with turn-buckles, or with a long thread, to draw the pipes together. Many, however, advocated digging the pipe up and relaying, or digging down to the joint and repairing with concrete.

The following are among the letters received:

W. C. Cushing (Penna. Lines).—In placing cast iron pipe 24 in. or more in diameter, build under each joint a block of concrete, 12 in. thick, 24 in. wide, and 48 in. long, parallel with the track. The pipe should be laid in position before the concrete is placed, so that it will get a good bond on the hub of the pipe. The ground around the pipe, for its full length, should be carefully tamped. We recommend that where pipes are put in under tracks in service the stringers supporting the track be left in place for several months, until the ground has become well settled around the pipe, before the full weight is thrown on it.

In slips, the best method of holding the pipe in place is to carry the small concrete piers to the bottom of the slip, if this is not too deep. In cases where the slips have been deep, we have driven pile foundations, three piles in a row, spaced 2 ft. on centers, parallel with the track, and spaced 4 ft. center to center parallel with the pipe. The top of the piles were concreted and the pipe laid on the concrete. Where a culvert in a slip was treated as above, in 1907, no movement has since occurred, either in the pipe or in the slip.

M. M. Barton (P. R. R.).—I have laid one 4-ft. and one 6-ft. (diameter) cast iron pipe in 12-ft. sections in the bed of the drainage canal, where there was a soft mud or muck bottom. In these cases we constructed a raft of old trestle timber the entire length of the culvert, with a bolster or cradle spiked on the raft for the pipe to rest in and keep it in line. We then floated the raft in place under the roadway, anchoring it to the pile trestle bents which support the track. After it was secured in position we laid the pipe at low tide and followed with the fill. The 4-ft. pipe has been in about seven years and the 6-ft. pipe more than three years, and both are in good condition.

R. G. Develin (P. R. R.).—On the mountains, or where our pipe culverts have much of a fall, we clamp them together with three clamps, these being about 3 x ⅜ x 16 in., bolted to the pipe on the inside. We do not put any clamps on the bottom of the pipe, as we want to leave the bottom surface as smooth as possible. We have been doing this for some years and have had no trouble with our pipes pulling apart.

B. F. Gehr (P., C., C. & St. L.).—My experience with laying cast iron pipe in soft ground is to place a cement pier just back of each bell; and, if under a heavy fill, also at the center of the pipe section, on a uniform grade. If the soil is such that it is necessary to build cement piers and there is still fear of settling a small amount under the track, it is well to leave the line of pipe crowning in the center. In addition, holes may be drilled in ends of the pipe and ¾-in. rods may be run through from the inside and bent over on the outside. I would use four clamps at each joint for a 3-ft. pipe and more or less according to the size of the pipe. This arrangement will prevent the sections from pulling apart.

A good method of repair when pipes are pulled apart is to draw them together with a steamboat ratchet or screw buckle.

W. Renton (B. & O.).—We had one pipe culvert with pile foundation settle to one side on account of soft ground on that side. We had to uncover it and couple up the pipe, which was 36 in. in diameter, and after we got it in place we used a 2½-in. rod 60 ft. long, running it through the pipe and anchoring it at each end. Another culvert settled and the pipe pulled apart. We put it back to place on a concrete foundation, buried it in concrete, and have had no trouble with it since that was done.

We have laid cast iron pipe culverts in soft ground on timber foundation, 10 or 12 ft. wide and the full length of the pipe. We generally use for this purpose second-hand bridge timber. Water covering the timber prevents decay.

D. B. Taylor (B. & O.).—The method I have used in clamp-

ing the pipes together is by using a hoop shape made either of round or flat iron, size 1¼ in. for 24 to 36-in. pipe, with three or four eyes in this, equal distances apart, placed on the extreme upper end of the culvert. Have this hoop shape made the exact size of the large part of the bell end of the pipe, and then similar hoops made to be placed below each of the bell ends of all the lower joints, to fit the outside of the pipe neatly, with six to eight eyes in them for the rod connections. The rods have threaded ends with nuts, to be tightened with a wrench and equally adjusted.

R. H. Reid (L. S. & M. S.).—Where we have placed iron pipe in extremely soft ground we have sometimes driven piles on both sides of the culvert line, capping these piles crosswise under the pipe, just back of the bell, so as to form a two-pile bent under each 12-ft. section of iron pipes; or, if the conditions warrant, we put two bents of two piles each under each section of pipe and place the pipe on saddles, the saddles being cut out to fit the curve of the pipe. We then fill in carefully over the pipe. In addition to this, where we have found it necessary, we have placed iron rods entirely through the pipe on the inside, with hooks over each end of the pipe with one or two turnbuckles in the rod for drawing them up tight.

In other cases of soft ground where the conditions have not been bad enough to require pile bents, we have placed old ties or old bridge stringers for saddles and have laid the pipe directly on them, clamping the pipe together with rods, as above mentioned. In one or two cases we have drilled holes in the pipe near the end and fastened the sections together with iron straps bolted through these holes. Where pipe culverts have pulled apart in soft ground, it is generally necessary to dig out one or two sections at each end, depending upon conditions, and close up the joints by resetting the pipe; and, if conditions seem to require it, place the iron rod clamp through the pipe culvert, as above noted. These methods have given general satisfaction and are still in use.

C. A. Stelle (W. & L. E.).—We have, on different occasions, used two methods. One has been in use for some time at Fremont, where the filling is settling next to the river. In this we have put a 1¼-in. rod through the 48 ft. of 24-in. pipe and a heavy iron bar at each end. We then screwed the sections together. This was done several years ago and the plan has been successful, although once the thread on the rod stripped and allowed the pipe to part. We, however, replaced this rod, and have had no further trouble.

At several other places on our line where the pipe had been placed on soft ground, I have used, in one instance, old car sills, laying about three of these sills in the bottom of the ditch, and placing the pipe on the same, thus providing against one section dropping below the other in case of pulling apart. This method has been successful in two instances, and in a third instance I have used 12 x 12-in. timbers with good results.

J. P. Canty (B. & M.).—It has been our practice when installing iron pipe under tracks to drive two rows of plank sheeting parallel to line of culvert and about 12 in. farther apart than the outside diameter of the bell end of the pipe between which, after excavation has been made to proper depth, a floor of concrete about 6 in. thick is laid. Upon the latter the cast iron pipe is placed, and the space outside of the pipe, between it and sheeting, is filled with concrete. We also cover the pipe on top to depth of 6 in. with concrete. The culvert pipe is thereby enclosed in a concrete casing that is square on the outside, the dimensions being about 12 in. greater than outside diameter of the pipe. As an additional precaution the plank sheeting is sometimes left in place.

With concrete heads on these culverts, the foundations of which are carried about 3 ft. 6 in. below the bottom of the culvert opening, we have had no trouble. The length, height and thickness of head walls will, of course, depend upon the height of the fill behind the same. Cases where pipes were broken under the track or pulled apart have not bothered us, as I now can recollect, except in places where there have been comparatively low fills. In these situations we simply put temporary stringers under rails, resting on the earth at the ends, of sufficient size to carry the load for the opening desired, and after excavating down to the pipe, relaid it as outlined above. In deep fills, where extremely long piles would be necessary to make an opening down from the track for such cases, I would advise tunneling from the end of culvert, if it was not possible to remedy the trouble from the inside of culvert pipe.

C. S. Knickerbocker (N. Y., O. & W.).—It has been our practice to put rods the entire length of the culvert, inside the pipe, and the same on the outside, to prevent the iron pipe from pulling apart. In this case, of course, the ends are enclosed in concrete, which is part of the parapet wall.

F. L. Stuart (Erie).—While it is true that no pipe should be put in where the foundations are so soft that it is liable to pull apart, in unimportant work the risk is sometimes taken, on the score of economy. In such cases I think the plan which offers the most hope of holding the pipe together is to lead the joints, put in a gravel foundation, build head walls and tie them together independently of the pipe. My idea is that the tying of the head walls would give some play to the pipe, whereas if clamps were put on at each joint they virtually make a girder of the entire pipe, and a settlement of the embankment will break this girder much sooner than it will open up the pipe with the head walls tied together.

Thomas L. Dunn (Maine Central).—I have put in very few pipe culverts on concrete or masonry foundations. In putting them in on soft ground I have generally laid the pipe on timber, making a solid bed of ordinary second-hand cedar cross ties 8 ft. long. Such a bed is more elastic than masonry, and I think the pipes are less liable to pull apart. Ordinarily, too, when laying pipe culverts in soft ground the earth is very wet and the timber therefore lasts indefinitely. In two or three instances where pipes have pulled apart, I have simply had the pipes jacked up to grade and thickened up the timber bed under them. Then if they were pulled apart more than 2 or 3 in. I have had a short piece of pipe put in and made connection with a sleeve. If pipes were pulled apart but 2 or 3 in., I would put a belt of concrete around the pipe.

G. A. Wright (Illinois Traction System).—About the best thing to prevent pipe from pulling apart that I know of is to fill the chime of the bell end with good, rich cement mortar, well packed in. This will hold the sections together under ordinary conditions. I have found it necessary, in some places, to put rods from end to end, with strong hooks to reach over the ends of the pipe and turnbuckles to draw them up tight. In some places where one or two joints have been added to the pipe already laid to widen the bank for second tracks or sidings, I have placed these rods on the inside of the pipe. These pipes added for wider fills I have found the hardest ones to hold to place, as the new fill generally slides down the slope of old one and carries the pipe with it.

As to repairing them when pulled apart, I have pulled them back with a heavy chain and steamboat ratchet. In some cases I have found it necessary to excavate down to the top of the pipe and alongside to about the center of diameter, before being able to move them. The rods used were made up in 12-ft. lengths, and these sections were coupled together with welded eye. Old bridge rods were utilized for the material.

A. S. Markley (C. & E. I.).—After laying pipe in place fill the bell around the spigot end of the pipe full of grout made of one part cement and three parts sand. Care should be taken that the grout is well mixed and stirred up while pouring, so that the sand and the cement will not separate. Care should also be taken that a clay roll or pipe jointer is held firmly against the bell of the pipe, to prevent the grout from escaping through an open seam. This method has been our practice for the past ten years and has proved very successful. Previous to using this method, in a good many cases, joints of pipe would partly separate, more particularly those on the outer ends of high banks, until the bead on the spigot end of the pipe would pull apart sufficiently to engage in the groove in bell end. In some cases, very rarely, the ends of the pipe will pull out of the bell,

disconnecting the joint. Where the ground was soft and the pipe likely to settle irregularly and out of line, the cement calking not being likely to hold, I have put three rods of about 1 in. diameter, depending on size of pipe, hooked over ends of pipe, with turnbuckles in the center of each rod, on the inside of pipe, to pull the sections firmly together before filling. The rods are divided at equal distances apart. If advisable the joints can be grouted, as above explained. After the pipe has thoroughly settled to a firm foundation the rods can be removed.

The only successful way of repairing pipe that is pulled apart under heavy banks is to dig them out and reset them. Under light banks, with open joints near the ends, I have jacked the ends up in line and pulled them together with crab and block and fall, either by anchoring the same at opposite ends of the pipe or by using jacks instead. Where the pipe has crushed under heavy banks I have lined them with one row of brick, laid rollerways, in cement mortar. This was done where the pipe was sufficiently large to take care of the water after lining. In one case this was done under a 60-ft. bank, and a 36-in. pipe flattened 3 in. out of true shape. This happened ten years ago and the pipe is still in good condition. In this case the pipe was broken under the center of the bank. At ends of the pipe, where it was undisturbed, no brick was placed. Where the brick terminated a sloping offset of cement mortar was put in to prevent drift, etc., from lodging against it. No trouble has been experienced in consequence of the installation of these brick.

Lee Jutton (C. & N. W.).—In repairing an open joint in a cast iron pipe culvert when the distance from base of rail to the bottom of the culvert is 5 ft. or less, the pipe should be dug out and relaid, at the same time providing a good foundation. When it is not advisable to do this, the joint can be repaired with concrete and cement. To do this the dirt should be taken out, as much as possible, under and around the pipe at the open joint and the space thus formed filled with concrete, finishing on the inside with cement mortar. If the waterway can be reduced at the culvert to be repaired, then a 6-ft. length of pipe having no bell may be put inside to cover the open joint. The difference in diameter between the two pipes should be enough to allow 2 or 3 in. of concrete to be placed between them. At the upstream end of the short length, the concrete should be tapered off, so that there will be no abrupt obstruction to the water.

J. D. Moen (C. & N. W.).—In my opinion, the manner of making repairs would be governed altogether by conditions. If the pipe is large enough for a man to work inside—say 36 in. or over—and the aperture is not too great, it might be cleaned out properly and filled with cement concrete. In cases where the pipe has pulled apart and either end has not settled below the line of the other section, a steel jacket might be fitted tightly on the inside to prevent any leaking or wash. If repairs are made with concrete, as mentioned above, it, of course, would be difficult to fill the upper part of the aperture.

J. M. Caldwell (C. I. & L.).—To repair pipe when it has pulled apart, I use old boiler iron bent to the diameter of the pipe, placing two pieces, with flanges, at the top side of the pipe and bolting them together through the flanges. We have discontinued using ordinary cast iron pipe and now have cast iron pipe in 3-ft. lengths, with a lock joint. This lock joint prevents the pipe from pulling apart.

The discussion brought out little additional information regarding handling cast iron pipe, but attention was drawn to some substitutes for cast iron. Regarding the use of concrete pipe culverts on the Southern Pacific, G. W. Rear said:

When an expensive foundation is necessary an iron pipe should not be used. We use concrete pipe in 3-ft. lengths up to 36 in. in size. For larger sizes we build concrete arches in place. We find we can put in four or five concrete pipes for the cost of one cast iron pipe. We do not use any reinforcing bars unless the pipe is large enough to be built in place. We make four sizes in stock, 12 in., 24 in., 30 in., and 36 in., all without reinforcement. We do not use concrete pipe unless it is 3 ft. or more from the top of the pipe to the base of rail. We use a 1:2:3 or 1:2:4 mixture of concrete and let it age at least 30 days before laying. The pipe has a recessed bell and spigot included in the thickness of the wall. We prefer to use good parapet walls to make the water go through the pipe and not through the embankment. If concrete pipes separate, the joints can be cemented from the inside.

In regard to the use of concrete pipe on other roads the following points were brought out:

Mr. Rettinghouse.—We are trying an experiment on 8-ft. lengths of concrete pipe and find it can be made and placed for about one-half the cost of cast iron pipe for 48-in. size and about two-thirds the cost for 36-in. size. The greatest objection to cast iron pipe is its uneven strength. Pipe for drainage is second-class material unfit for pressure work. Data should be collected to allow specifications to be drawn to insure an even quality of pipe for drainage purposes.

A. E. Killam (Intercolonial).—We use both cast iron and concrete pipe, but in soft ground always put a concrete foundation under either type. We allow concrete pipe to season one year before laying and have had no failures. Some pipes are in service in climates having a temperature as low as 50 deg. below zero, but even in these extremes we have had no cracking due to water freezing in cracks.

The use of corrugated iron pipe for railway work was condemned by several members on account of its liability to rust and mechanical destruction. Lock-joint pipe was also declared unsatisfactory by many, for in soft ground the locking feature is declared to be inadequate to support the load.

BUILDINGS AND PLATFORMS FOR SMALL TOWNS.

C. H. Lake (M. R. & B. T.), Chairman of Committee.—Where but a small amount of freight or passengers are handled, it would seem that a combination freight and passenger station should be used. The platform should be less than a foot above the rail and not less than 10 nor more than 16 feet wide. The length should be governed by the maximum length of train scheduled to stop at that town. A small platform on level with a car floor may be desirable, inside, or at the end of the freight room, but should not be near enough the track to endanger passengers or employees.

The station should, wherever practicable, be placed on the side of the track nearest the town. When, as is usually the case, the station is located near a street that crosses the track it should, if practicable, be located so far from such street that the local passenger trains scheduled to stop there do not obstruct the street. At stations where such street or highway exists, the waiting-room end of the station should be toward the street or road and the freight room at the far end. This will overcome, in a large measure, the danger of passengers walking or stumbling over freight left lying on the platform at or near the freight room.

For stations where but a small amount of freight is handled, a house track back of the station is not desirable. Where, however, a large amount of freight is received, as is occasionally the case in small towns and on busy roads, and considerable time would be lost by local freight trains getting out of the way of other trains, a track back of the station is desirable. With such an arrangement merchandise freight received in large quantities may be unloaded by the station or other forces into the freight rooms, and local freight train crews may be unloading while waiting for through trains to pass.

Elevators, coal bins, cotton and broom corn platforms, stock pens and such structures may then advantageously be located along the side track, but far enough from the station or other important buildings as not to endanger them should they take fire.

Ordinarily, section hand car and tool house should be placed next to the main track and outside the side-track limits. Much time is frequently lost by section workmen being prevented from leaving their tool houses by trains standing on the main or side track within the side-track limits.

Coal bins, coal boxes, privies or other out-buildings must

be located to suit the general conditions of the town, climate and surroundings. In northern climates it is probably best to store the coal in a bin partitioned off in the freight room. If this is not practicable, an outside building or covered box may be used. A coal house adapted to the needs of a station in Dakota would be out of place in Florida.

As to the materials of which a station platform may be built, our attention has been called to the use of locomotive or ash-pan cinders, in a manner that is serviceable, neat in appearance and on a scale of cost that is appropriate for buildings of cheap or moderate construction. Cinders soon pack down hard and make a good surface to walk upon, and one that will keep dry under foot. By the use of a curbing next to the track, the cinders can be retained at the desired grade. On some of the roads or at stations where cheap construction is suitable such curbing is made by using old sway braces, with split pile butts for stakes. To provide a smooth surface for trucking to and from the trains, old bridge stringers are laid flush with the top of cinder surface, in two lines parallel with the track, and at the proper distance therefrom to permit loaded trucks to be pulled alongside the trains.

The discussion was confined almost entirely to the advisability of providing a freight track behind the station. It was pointed out that such a track is dangerous because it may be used for a passing track, and it is objectionable because cars may be left standing on it and thus cut off the access to the freight room. On the other hand it is desirable because it allows freight to be unloaded without blocking the main track or interfering with passengers. It was decided to refer the subject back to the committee for further consideration. The model plans presented with the report were not accepted.

SUPERELEVATION ON BRIDGES.

J. P. Snow (B. & M.), Chairman of Committee.—Superelevation of the outer rail for curves on bridges may be obtained by one of the following general schemes, or a combination of two or more of them:

1. By building the masonry bridge seats out of level or by using beveled shoes of different heights under the bridge bearings, as in Fig. 1.

2. By building the stringers or girders supporting the ties so that their tops will be out of level (Fig. 2).

3. By capping the trestle bents, either pile or frame, out of level or the equivalent of using a tapered cap, a tapered shim on a level cap or by tilting a framed bent on inclined footings (Fig. 3).

4. By tapering the ties, as in Fig. 4.

5. By shimming under the ties, as in Fig. 5.

6. By shimming under the high rail, as in Fig. 6.

Thirty replies were received to a large number of circulars sent out by the committee, and the first five of the methods above received approximately equal numbers of advocates. No. 6 has no supporters.

Ballasted-floor bridges are not here specifically considered. They solve the question of superelevation at once, without special consideration; although for bridges of this class on curves some provision should be made to prevent trackmen or the action of trains from throwing the rails from their exact prescribed position, else there may be trouble from improper clearance.

1. In Fig. 1 the girders are inclined from the vertical. For moderate elevation it is advocated by twelve replies. Some doubt the advisability of this inclination, on account of the action of the live load; but one thoroughly competent engineer considers that the girders in this position support the loads more conformably to the calculations. It is likely that high-speed trains will strain the transverse bracing less, and slow trains more, than if the girders were vertical.

Several object to Sketch "a," on account of the difficulty of building the masonry. If of concrete, however, such difficulty is not apparent. Many advocate securing part of the elevation in this way and the balance in the ties. Several replies class this scheme as bad practice. It is, of course, out of the question for truss spans.

2. Thirteen replies favor the scheme in Fig. 2. A few object to it on account of dapping the ties across the grain. Cases are numerous where ties have split when so dapped, necessitating bolts. The scheme is applicable to deck and through girders as well as to truss bridges.

3. The method shown in Fig. 3 applies only to timber trestles, either pile or frame. Fifteen approve one style or other of this figure. A few object to "a" as difficult framing or as being unsightly. Plans "b" and "c" require an excess of timber, and "c" furnishes a bad joint for inducing decay. Plan "d" is advocated by only one reply. The purpose of this style seems to be to secure square framing.

The committee is not a unit on this matter, but those having

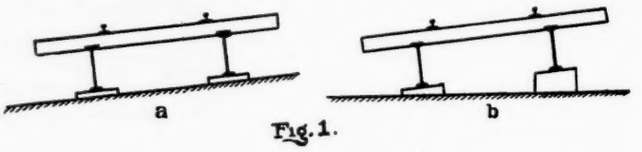


Fig. 1.

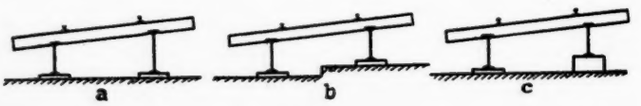


Fig. 2.

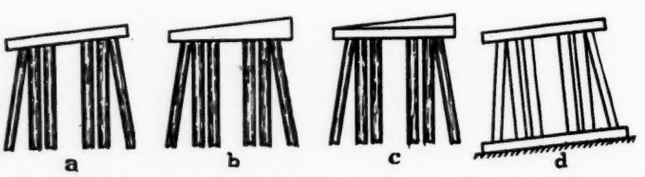


Fig. 3.

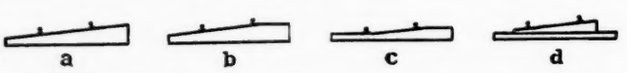


Fig. 4.

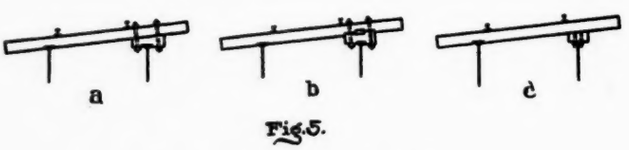


Fig. 5.

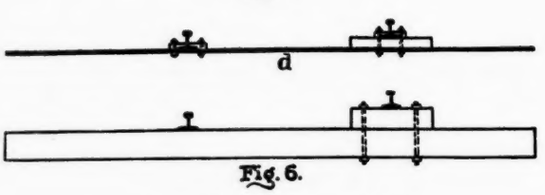


Fig. 6.

Superelevation on Bridges.

the largest number of trestle bridges prefer style "a" and experience no difficulty in its use.

4. Seventeen expressed approval of some style of tapered tie (Fig. 4). All should have a certain minimum depth under the low rail equal to the standard for the stringer spacing in use.

Several members object to tapered ties of any kind, holding that the regular stock size for straight-line bridges should be used in all cases to simplify labor and material carried for repairs. Style "b" allows the use of a smaller stick than "a" for a high elevation and is just as efficient. Style "c" is the standard on the Boston & Maine road for metal bridges. It is somewhat expensive, in that it has to be adzed to shape; but bridges on curves are of no great length, and the labor item for a given

bridge is hardly appreciable. Its advantage is that the depth at the thin end is not reduced too much for properly holding the guard timber, and that the low rail is not canted away from the traffic, as it is on all other inclined ties. Style "d" is advocated by one reply as a good method on a double-track deck with long ties. The shim is 8 feet long and is well bolted to the tie.

5. Nine advocate shims under the ties (Fig. 5). Several object to these on account of their getting out of place, etc. Plan "b" was used by the Baltimore & Ohio, when 16-in. timber was in style. Plan "a" does not give sufficient elevation and can hardly be subject to this objection. Style "c" is advocated by some and objected to by others. It is a longitudinal timber as wide as the girder flange and bolted thereto. Style "d" is used on solid plate-floor bridges without ties. It is objectionable on block signal lines, as perfect insulation is uncertain, which necessitates cutting the bridge out of the circuit, so that a car on the bridge or a broken rail on it would not put the signal at danger.

6. The scheme as portrayed in Fig. 6 received no support among the replies, except for temporary work.

All the schemes shown except No. 3 apply to metal bridges. It is well agreed that timber bridges of all kinds should have the stringers placed in a plane parallel to that of the rails. In the case of trestles, it is the opinion of the committee that there is no valid objection against framing the caps to the proper inclination to receive the regular standard straight-line tie. In timber stringer bridges resting on masonry, tapered wall plates should be used.

For metal bridges any of the schemes described will give good service if the fitting of the ties to the bridge and of the bridge to the masonry is perfect, so that no movement will occur. The simpler these fittings are the more certain it will be that good fits will follow. To secure favorable conditions of simplicity, the masonry should be level, and the lower face of the tie should be parallel to the plane of the top flanges of the stringers. These conditions reduce us to "b" of Fig. 1 or to Fig. 4. Our replies indicate that not over 4 in. superelevation should be obtained by scheme 1; hence if more is required it should be obtained wholly by 4 or by a combination of 1 and 4.

After a short discussion a resolution was passed declaring the sense of the association to be that superelevation should be obtained as shown in Fig. 3 "a" for pile trestles and frame bents; as in Fig 1 "a" for I-beam and deck plate girder spans of medium length if concrete bridge seats are used; as in Fig. 1 "b" for I-beam and deck plate girder spans of medium length if masonry bridge seats are used; and as in Fig. 4 "a," "b" or "c" for through truss and girder spans and for long deck plate girder and deck truss spans.

WIRE GLASS.

E. E. Wilson (N. Y. C. & H. R.), Chairman of Committee.—From a total of sixty-five circulars sent to members of the association who have in hand the erection and maintenance of buildings in which wire glass is or could be used, the committee received fourteen replies. Of the fourteen replying nine reported that they do not use wire glass at all; two use it partially; two use it extensively, and one reports having stopped using it. Owing to the incompleteness of our information, we do not feel that we are in a position to make any recommendations on the subject.

Wire glass costs about 50 per cent. more than plain glass. It is less liable to do damage after being broken, on account of the wire preventing pieces from falling. Plain glass with a wire netting hung underneath, to prevent pieces of broken glass from falling, is not efficient, as the netting may rust away so quickly that its renewal is quite an item of expense.

Large sizes of wire glass are not economical; first, because of the additional cost of large sizes; second, because of the additional chance of large sizes being broken. Sizes 24 in. x 36 in. in skylights and sizes 36 in. x 40 in. in doors and partitions are economical sizes.

The gas and smoke from locomotives, because of their influence on the metal framework of train sheds and skylights of roundhouses, is the primary cause of the breaking of much glass. Contraction and expansion of metal frames is also a serious cause of breakage where glass is tightly fitted to the frames. Glass set horizontally or at an angle breaks more readily than glass set vertically. Wooden bars for frames or sash are preferable to steel, on account of the effect of gases on steel bars; also there is less liability of breakage by expansion and contraction where wood is used. It is not practicable to use wire glass in roundhouse doors and windows, but it can be used in skylights and monitors of roundhouses, in train sheds and in roofs of shops and in station buildings.

Wire glass windows and partitions in buildings will withstand extreme heat without breaking and falling out, and thus prevent the spreading of fire to some extent. Several fire chiefs from the larger cities have recommended that it be used wherever possible to do so.

Below are three of the letters received:

H. H. Pollock (P., C., C. & St. L.).—As almost all glass around engine houses and shops is broken by flying pieces of steel, such as rivet heads, etc., I do not think wire glass would reduce the cost of maintenance, for it would certainly break under such conditions. We aim to use small size glass around our engine houses and shops, so that when a missile goes through the damage is small. Glass such as we use will cost about 4 cents per light.

George W. Andrews (B. & O.).—We use a large amount of wire glass in buildings on this system, principally in skylights of train sheds, warehouses, stations, etc. Our main office building in Baltimore has all windows in the fourteen stories of polished wire glass, the sizes used running anywhere from 18 in. square up to 24 x 60 in. The glass used is both rough, ribbed and polished; usually rough or ribbed on skylights and polished in doors and windows.

I consider it practicable to use wire glass in any opening where glass may be required. It is not economy to use it for all purposes, as the glass costs practically double that of plain glass.

We have experienced a great deal of trouble with wire glass, caused by cracks due to expansion and contraction, the cracks very often causing leaks, especially in skylights.

I believe this could be overcome in a great measure by allowing more space between the skylight bars, thus giving the glass room to expand.

My recommendation in this matter would be to use wire glass in all skylights and in all buildings that it is desired to make fire-resisting. I do not think it would be economy to put it in buildings of a temporary character or in frame buildings, other than in skylights, as first mentioned.

M. M. Barton (Penna.).—We use wire glass in train shed skylights and monitors, pier shed skylights and in buildings where fire protection is deemed necessary. We use the rough glass for skylights and monitors, and polished article in doors and windows of buildings.

Rough wire glass 22 or 24 in. wide by 72 to 90 in. long and ⅜ in. thick costs 22 cents per square foot. This is used in skylights on train sheds, piers and freight houses. Rough glass (not wire) of same dimension sizes costs 13 cents per square foot. Polished plate of same dimensions costs 48 cents per square foot. None of this glass will hold an even thickness. Variations of 1-32 to 1-16 in. are frequent. Polished, wire and common plate glass in the trade is listed ¼ in. thick, but varies the same as does the ⅜ in. thick rough. Polished ¼ in. thick wire glass, in sizes up to 18 in. x 24 in., costs 40 cents per square foot. Rough glass 23 in. x 23 in. by 1 in. thick in use on veranda over sidewalks, Broad Street Station, costs 70 cents per square foot. Florentine glass used in elevator door shafts and partitions, also figured rolled glass ⅛ in. thick with a variation of 1-32 in. costs 12 to 15 cents per square foot. These prices are based on 1909 net quotations. At present there has

been a sharp advance in the price of all glass, especially polished wire and plate, which have advanced 40 to 60 per cent.

It is practicable to use wire glass in roundhouse doors and windows, but I do not approve of its use for this purpose.

It is economical to use in windows and partitions where the glass is vertical, panes not over ¼ in. thick and in sizes up to 18 in. x 24 in. When this size is exceeded the cost advances 75 to 80 per cent.

Since the liability to breakage in wire glass is less than it is with plain glass, I believe the cost of maintenance is less than it is with the plain glass.

Mr. Clark.—In some places we are compelled by city ordinances to use wire glass for skylights, but it is not economical for windows and doors.

Mr. Staten.—We have used wire glass for train shed roofs and had trouble with leaks. They were stopped by stuffing them with any material convenient, and the result was very unsightly.

Mr. Rettinghouse.—The use of wire glass in roundhouses is advisable if wooden brads are used to hold it in instead of putty, which falls out easily and causes a large percentage of the breakage.

Mr. Cahill.—Putty must be used on horizontal surfaces to make watertight joints. The objections to putty can be decreased if the sashes are well primed before puttying to prevent the dry wood absorbing all the oil from the putty.

HOOPS FOR WATER TANKS.

T. E. Weise (C., M. & St. P.), Chairman of Committee.—The committee received a very generous response to the inquiries sent out and the replies show a wide range as to experience and opinion.

Four styles of hoops are being used for tanks of 50,000 to 100,000 gallons capacity: (1) flat hoops, (2) square hoops, (3) round hoops, (4) segmental hoops, also variously designated as half round, half oval, or half elliptical.

Until quite recently flat hoops were used almost universally for tanks of all sizes. There are many who advocate this style as the best for the tanks under consideration, claiming that they have a more uniform bearing on the staves, do not crush the fiber of the wood, and if properly put on and cared for will outlast the staves. The Illinois Central cites an instance in which they took down a 100,000-gallon tank with flat hoops, that had been in service 16 years. The hoops and also those portions of the staves under the hoops were found in perfect condition, and the tank was again erected at another location without any substitutions.

The experience of other members of the association has been quite to the contrary. Flat hoops have been removed after a comparatively short service, badly corroded on the inside and with the staves under the hoops badly decayed. Location of the tank is quite a factor in the life of a hoop. If located at a terminal, perhaps next to an engine house or a clinker pit, the hoops will deteriorate rapidly. There are also instances in which the kind of water in the tank is especially injurious to the hoops, and location near salt water is also a severe test. In some cases the decay of the staves under the hoop seemed to be directly due to the rusting of the iron.

It is quite generally recommended that flat hoops be given two coats of graphite, asphalt or mineral paint before erection and that the staves also be painted at least one good heavy coat on the outside. Taking off the hoops and cleaning them on the inside is considered an expensive operation and impracticable.

Flat hoops are the standard on the Ill. Cent., the L. S. & M. S., the T. P. & W., the Mich. Cent., the P. C. C. & St. L., the Cent. of Ga., the M., St. P. & S. S. M., the C. & S., the C. & N. W., the B. & M., the Nor. Pac., the Intercolonial, the N. Y. C. & H. R., the M., K. & T., the P. & L. E., the Florida East Coast, and possibly some others.

There is great variation in the dimensions of flat hoops. In thickness they run from ⅛ in. to ⅜ in. and in width from 3 in. to 6 in. Some roads use a uniform thickness and vary the width, some use a uniform width and vary the thickness, while others use various widths and thicknesses. There is also much variation as to spacing, but for obvious reasons the wider and thicker hoops are placed near the bottom of the tank and the narrower and lighter ones toward the top, placing the lower hoops quite close together and widening the space as they approach the top.

On the Florida East Coast all the hoops are of the same size, namely, $\frac{3}{16}$ in. x 3 in., and the lower six hoops are put on in pairs.

In recent years it has not always been easy to obtain wrought iron flat hoops, and therefore steel hoops are used. Steel hoops are found to be quite brittle, and quite often break while being tightened, or as the result of the swelling of the tank, or on account of unusual weather conditions. The most serious objection is that they corrode more easily than wrought iron.

Galvanizing of steel hoops lengthens their life, but does not eliminate the brittleness, and many claim that the galvanizing covers surface defects that would otherwise cause the rejection of the material. When galvanized hoops are used, they should be inspected before and after galvanizing.

Round hoops have come into use only within the last few years and seem to be proving very satisfactory. Wrought iron is considered the best material and is more easily obtained in this form than in the flat shape. Mild steel is sometimes used, in the round hoop as well as in the flat hoop, but the same objection of brittleness is present.

One argument in favor of the round hoop is that fully 90 per cent. of its surface is exposed to view; deterioration is more easily discovered and painting is more effective. With the flat hoop, at least 40 per cent. of its surface is next to the staves and practically inaccessible.

A number of railways, such as the P. & R., the M. & St. L., the L. & N., the W. & L. E., the C., M. & St. P., and the L. E. & W., are using round hoops exclusively in the construction of new tanks. The M. & St. L. is also using round hoops in repairing old tanks, either by adding them to make the tank safer or substituting them for worn out flat hoops.

It is claimed that because the round hoop has less bearing surface on the stave it crushes into the fiber and not only weakens the stave, but induces decay. Others who have had experience say that if the hoop is properly put on there is no appreciable crushing of the fiber.

The round hoop forms a ledge or pocket on the upper side which allows the accumulation of dirt, cinders and moisture. Some claim that this is not a serious matter because the sun and wind evaporate the moisture before harm can result. It is also claimed that where flat staves are used the hoop does not touch the center of the stave and moisture is not retained. This may depend on whether the wood is soft or hard; some tanks have been examined that showed no such drainage space. On the W. & L. E. it is the practice to calk the round hoops with oakum and fill the top space with roof cement to shed water and also to protect the hoops.

The committee received no report from any railway that is using square hoops as a standard. The Illinois Central has one tank equipped with hoops ¾ in. x 2 in., which may be called square hoops for all practical purposes, that have been in service for about 20 years, and the hoops, which are of wrought iron, show no great sign of deterioration.

E. L. Loftin, of the Vicksburgh, Shreveport & Pacific, writes that his company uses steel tanks entirely, but that a great many wooden tanks with square hoops are used in that part of the country. The hoops are from 1⅛ in. square to ¾ in. square, put on in three sections, with lugs similar to those used with round hoops.

The segmental hoop has one flat side and does away with the objection to the round hoop of crushing into the wood and of collecting and holding dirt and moisture. It has all the advantages of the flat hoop, with the added one of being narrower for the same strength; and, because it is heavier at the center,

it is not weakened so quickly by corrosion. The N. Y. C. & H. R. has used half round hoops for tanks on some divisions. The Southern Indiana built a 20 ft. x 30 ft. tank with segmental hoops the past summer and is well satisfied with it. Material of this section is a standard shape and is carried in stock, hence it does not have to be specially rolled.

Flat and segmental hoops are fastened or brought together by pairs of lugs made of either cast or malleable iron. In some cases the lugs are riveted to the ends of the hoops, while in others they are clamped on by a wedge, which is assisted by a slight kink near the end of the hoop. The pair of lugs is then brought together by either one or two bolts or, more properly speaking, rods with nuts at each end, and in this way the hoop comes into proper contact with the tank.

Another form of lug that does away with the riveting is in use on the Michigan Central. In this method the hoop is bent to fill a hollow in the lug castings, which are clamped together with U-bolts.

K. Peabody, of the N. Y. C. & H. R., tells of one style of lug in use on that road that is rather interesting. The hoops are bent back on themselves and welded. Through the loop thus formed, a vertical iron rod 2½ in. in diameter is passed. Each end of this rod is drilled for a 1⅛ in. bolt Two such bolts with 6 in. thread on each end are used to tighten the hoops. This method prevents any cocking up of the lug.

Segmental hoops are riveted to cast iron lugs. As used by the Southern Indiana, the hoop is bent up around a rounded portion of the lug and a hole is punched through it so that the bolt passes through both lug and hoop.

Square and round hoops are brought together by very simple lugs made up of a single casting having two lateral holes through which the threaded ends of the hoops are passed and fastened with nuts at opposite sides. The hoop is brought into the required contact with the tank by tightening these nuts. This simple lug and the way in which it is applied is one of the arguments in favor of the round hoops. The lug adopted by the L. & N. as its standard is the style generally used.

It is the usual practice in tanks from 20 ft. to 30 ft. in diameter to have the hoops in three sections, although there is some difference of opinion as to what is best. The C. & S., the L. E. & W., and the P. & L. E. use two sections. The Mich. Cent. and the W. & L. E. use four sections for tanks 30 ft. in diameter. There are others who apply the lower and heavier hoops in four sections, and those above in three and sometimes two sections.

The two-section hoop is difficult to erect, and by using more sections the stress on the staves can be more uniformly distributed.

It is quite generally recommended that the tank should have one or two good coats of paint on the outside before the hoops are applied, and that the hoops should have one good coat of mineral or graphite paint on the inside, and two coats if practicable. The outside of the hoop should be painted with the same kind of paint, and as frequently as the remainder of the tank, at intervals varying from three to five years.

So many factors enter into the durability of tank hoops, such as material, kind of water in tank, proximity to engine terminals, manufacturing plants, salt water, etc., that the decision as to which hoop is best to use must be very largely a matter of personal judgment and familiarity with local conditions.

C. A. Lichty (C. & N. W.).—There is no doubt that the wrought iron hoop is much better than the steel one; and considering its length of life it is also more economical. The material is more important than the shape.

Mr. Clark.—The Baltimore & Ohio has adopted the wrought iron hoop and will not accept anything else.

James Dupree (South. Ind.).—The thin flat hoop and the round hoop expose too great a surface and therefore corrode more quickly. The thin hoop has the advantage that it fits the staves closely. The round hoop is compact and easily inspected. But the advantage of the flat hoop is slight because it does not fit close enough to exclude water, and the advantages of the round hoop are outweighed by the fact that it crushes the wooden staves and catches water and dirt. The half round or segmental hoop is compact, does not expose as much surface as the other forms, and does not hold water or dirt. Such a hoop should have a life as great as that of the wooden tub.

After some further discussion a motion was passed recommending the flat wrought iron tank hoop for all sizes of tanks.

FIREPROOF OIL HOUSES.

G. W. Rear (S. P.) Chairman of Committee.—The storage should be of sufficient capacity to permit of emptying tank cars or barrels promptly and with as little labor as possible. The delivery of oil should be in charge of the regular storekeeper and be issued on requisition, so that it can be properly accounted for. This method of handling tends greatly to economy in its use. Consequently it is necessary that the oil house shall be near enough to the general store to permit of having the delivery pumps or faucets in the storeroom; and while it is possible to pump the oil a considerable distance, it is seldom possible to place the oil house at any great distance from other buildings, as the usual layout of terminal provides very cramped space for the necessary buildings.

The committee believes that buildings can be built and systems of handling devised which will permit the oil house to be placed anywhere that may be convenient without increasing the fire hazard.

The building itself should be of fireproof construction, designed especially for the handling and storage of oil, and should be equipped with facilities for filling cans and barrels for shipment to small stations, and for the unloading of oil received.

The storage room should be underground, if possible, and should have concrete walls, floor and ceiling. The second floor and roof should be of fireproof construction, but may be of concrete, brick or steel frame, with galvanized iron roof and walls, as may be desired. The fill boxes, pumps and drip pipes should be on this second floor.

The oil should be stored in suitable tanks of such a size as will permit of prompt unloading, whether delivered in tank cars or barrels. This permits cars to be released and barrels or drums to be returned without delay, and greatly reduces the loss from leakage.

The tanks should be dust-proof and should be placed low enough to permit emptying oil into them by gravity. If the drainage will not permit placing the tanks below the ground level, it will generally pay to elevate the receiving track.

The tanks should be made of open hearth steel with lap riveted seams and well calked. No substituted for caiking, such as red lead paste, paper felt, etc., should be permitted, for in time they will dry or crumble and fall out, leaving a leak.

Before the tanks are put to use air pressure should be applied, to make sure that they are tight; and manholes with removable covers should be provided so that the tanks can be inspected or cleaned.

Indicators should be provided to show quantity contained, in gallons or otherwise.

The tanks should be equipped with suitable automatic vents to allow air to escape or be drawn in when filling or emptying, and those used for volatile oils, especially gasoline, benzine, naphtha, etc., should have a special vent pipe run to the outside of the building and to a sufficient height to insure against evaporation. This will permit gases to escape in case of excessive heat, thus removing all possibility of explosion.

It is probably best practice to bury tanks containing gasolene, benzine and naphtha, in the ground, or place them in a special vault outside of the regular oil house.

Where tank cars are used, supply pipes should be furnished leading from the cars to the tanks, a separate pipe being used for each kind of oil. These pipes should be permanently con-

nected to the tanks and equipped with flexible connections to attach to cars. These flexible connections should be arranged so that they can be swung out of the way when not in use, and should be equipped with caps or valves to keep dirt and air out when not in use. Steam pipes for heating the oil in the cars may be necessary, and if so, should be provided.

If the terminal point furnishes oil to smaller stations, steel barrels or drums should be used, and separate pumps or faucets should be provided for this service; but the committee is of the opinion that the best method of supplying oil to small stations is by a supply car equipped with tanks of sufficient capacity, and by pumping the oil through hose direct to the tanks in the local oil house. This method is in use on several large roads, and they report a large saving from loss by waste and leakage, which is bound to occur in shipping oil in cans or barrels.

For making small deliveries of oil to engines, mechanics, etc., the best method is to use an automatic measuring pump, one having a continuous meter being the best. Several very reliable pumps for this purpose are on the market.

For filling barrels or large cans the oil can be handled by hand or power pumps, or by the use of compressed air. While it has generally been believed that the use of compressed air for handling illuminating oils is objectionable, on account of deterioration caused by moisture in the air, there is a strong opinion on the part of storekeepers and practical men that the use of air does not deteriorate the oil for practical purposes. Several roads use air pressure in some part of the handling of all their oils, and seem convinced that if there is any deterioration it is not to such an extent as to be noticed by the ordinary observer. Air pressure is of particular advantage in handling oil from supply cars, as the air can be taken from the train pipe, and other power is not likely to be available.

The Atchison, Topeka & Santa Fe has a combination store and oil house at Topeka, Kan., 50 ft. x 150 ft., with 31 tanks in the basement, varying from 220 to 10,000 gallons capacity. It has a covered platform 20 ft. wide along one side of the building, the entire length. The house is built of fireproof construction throughout. The basement walls and floor are of concrete, and the main floor of reinforced concrete. The system of handling oil is described as follows:

"From our new oilhouse at Topeka is handled the entire supply of lubricating and illuminating oils for the Santa Fe system. We have a storage capacity of 150,000 gallons, which includes paints and oils such as raw and boiled linseed oil, turpentine, etc. We have 31 storage tanks with 31 long distance self-measuring pumps of the S. F. Bowser make. In fact, the plant complete was installed by the Bowser people. We also have seven steam pumps with which oil is transferred from one tank car to another. All of our oil on the Santa Fe system is handled in tank car lots with one or two exceptions. We have storage tanks of sufficient capacity for two or three months' stock at practically all of our terminals.

"With this new improved oilhouse and storage plant at Topeka it enables us to transfer oil from Union Tank Line cars to our own at Topeka, thereby cutting out the mileage and per diem charges on foreign cars. Under the old system the Union Tank Line cars were sent to the farthest point, Richmond, Cal., on our system or south to El Paso and Galveston, and by the time the car was returned home we had from $25 to $35 charges covering the car. We have cut out this extra expense and have 25 cars of our own in service for handling of headlight, mineral seal, signal, engine, car and valve oil. We can transfer 200,000 gallons in ten hours at this plant.

"At the outside terminals we have what is known as the combination oil and storehouse. We have discontinued building the old style oilhouses separate and distinct from the storehouse; instead, we build a concrete basement under the storehouse platform ranging from twenty to one hundred feet away connected up with the Bowser long distance self-measuring pumps, placing the pumps in the end of the storehouse so that the man issuing the material and supplies can also take care of the oil department as well. By this arrangement we have eliminated the first cost of the oilhouse and have reduced the cost of handling by reason of the combination which does away with the special men that would have to be employed to take care of the oilhouse, which means one during the day and one at night. We might say from $90 to $100 per month represents decrease in handling by reason thereof.

"The delivery of oil to stations is handled from the supply car direct. We have storage tanks at each station based on their issues and the stock is replenished monthly from the supply car which is equipped with a hose connection so that we can fill the storage tank in two or three minutes. By this system we do away with the two, five and ten-gallon cans. This system seems to be very satisfactory indeed by reason of cutting out entirely of local shipments.

"We have the Bowser system of self-measuring and metering pumps at all points and since their installation we have been able for the past two years to show a slight overage in each of the different grades of oil. Prior to this time we were, at the end of each year, from one to three per cent short."

The report was accepted with the recommendation that the subject be continued next year.

REGULARITY AND SAFETY.

Mr. Rettinghouse read a paper on "Regularity and Safety," which followed closely the outline of an address given by Ralph C. Richards, general claim agent, Chicago & North Western, advocating greater safety for railway employees. Mr. Richards' article appeared in the *Railway Age Gazette* of September 2.

NEXT YEAR'S REPORTS.

The subjects for committee reports for 1911 include the following, which are carried over:

Best Method of Numbering Bridges.

Buildings and Platforms for Small Towns.

Sash, Size and Kind of Glass That Is Not Economical for Roundhouses and Shop Buildings.

Plans of Fireproof Oil Houses.

In addition to these, the following new subjects will be considered:

Best Method of Fireproofing Frame and Trestle Bridges.

Derricks or Other Appliances for Handling Heavy Material in Supply Yards.

Pumping Engines, Best Kind and Ones Most Economical to Use, Gasolene, Oil or Electric.

Records of Bridges, Buildings and Other Structures Showing Cost of Construction and Maintenance.

Concrete Tank Construction and Recent Developments and Suggestions.

Advisability of Using Brick Veneer for Station Buildings.

Roofs and Roof Coverings.

It was decided to hold the next convention in St. Louis, Mo., October 17-19, 1911.

The exhibits, which were in the lobby of the hotel, included the following:

Allith Manufacturing Co., Chicago.—Door hangers, fixtures, asphalt, ready roofing. Represented by W. D. Jameson.

Harry H. Huested.—Samples Arrowhead and Protection roofing.

Barrett Manufacturing Co., New York.—Barrett specifications. Represented by L. P. Sibley, William S. Babcock, Harry B. Nichols.

Phillip Carey Co., Cincinnati, O.—Samples Carey's roofing, standard and roofing paints. Represented by J. P. Stagg, John L. Morse.

Paul Dickinson, Inc., Chicago.—Designs of smoke jacks, chimneys and ventilators. Represented by J. A. Meaden.

Eastern Granite Roofing Co., New York.—Samples of Granite, Tisbest and Evertight roofing. Represented by H. Henning, C. F. Barstow.

Fairbanks, Morse & Co., Chicago.—No. 12 gasolene hand car, No. 26 section motor car, three Barrett jacks. Represented by C. W. Kelly, Edward M. Fisher, J. T. Gratiot.

H. W. Johns-Manville Co., New York.—Samples Ruberoid and J. M. asbestos roofing. Represented by F. M. Gilmore, P. C. Jacobs.

The Leahon Co., Chicago.—Samples Roofrite rubber roofing, Polar Bear insulating paper and paints. Represented by Thomas Leahon.

Luitweiler Pumping Engine Co.—Model Luitweiler deep well pump. Represented by E. D. Williams.

Otto Gas Engine Works, Chicago.—Designs coal chutes, water softening plants, pumping plants. Represented by O. C. Lazenby, R. E. Gurley.

Standard Railway Equipment Co., Pittsburgh, Pa.—Samples Monarch mica web and mica surface roofing. Represented by E. Payson Smith.

Straight Scale Co.—Model straight track scale. Represented by William M. Welsh.

TRAIN ACCIDENTS IN SEPTEMBER.

Following is a list of the most notable train accidents that occurred on the railways of the United States in the month of September, 1910. This record is intended to include usually only those accidents which result in fatal injury to a passenger or an employee or which are of special interest to operating officers. It is based on accounts published in local daily newspapers, except in the case of accidents of such magnitude that it seems proper to write to the railway manager for details or for confirmation:

Collisions.

Date.	Road.	Place.	Kind of Accident.	Kind of Train.	No. persons reported Kil'd.	Inj'd.
2.	Erie	Lake Ariel.	bc.	P. & P.	2	3
6.	Wheeling & Lk. E.	Run Junction.	xc.	Ft. & P.	1	12
12.	C., C., C. & St. L.	Brightwood.	xc.	P. & P.	2	2
12.	Phila. & Readg.	Coatesville.	xc.	Ft. & Ft.	2	0
16.	Chic., B. & Q.	Holt, Mo.	bc.	P. & P.	1	19
18.	Mobile & Ohio	Beech Ridge.	bc.	Ft. & Ft.	4	2
*18.	L. S. & Mich. So.	Westfield.	rc.	Ft. & Ft.	1	0
20.	Boston & Me.	Concord, N. H.	xc.	P. & Ft.	0	5
*21.	Penn. Lines	Delaware.	rc.	Ft. & Ft.	1	2
22.	Mich. Central	St. Charles.	xc.	Ft. & Ft.	2	0
23.	Southern Indiana	Terre Haute.	bc.	Ft. & P.	2	19
24.	Phila. & Readg.	Norristown.	xc.	Ft. & Ft.	2	0
26.	Missouri Pac.	Herman.	bc.	P. & Ft.	3	0
28.	Chic., M. & St. P.	Cannon Jnctn.	xc.	Ft. & Ft.	1	3

Derailments.

Date.	Road.	Place.	Cause of derlmt.	Kind of train.	No. persons reported Kil'd.	Inj'd.
2.	St. L. & San Fran.	Frchmn's Bayou	ms.	Pass.	1	1
2.	Boston & Albany	Riverside.	ms.	Pass.	0	6
5.	Illinois Cent.	Council Hill.	brakeshoe.	Pass.	1	8
†7.	Great Northern	Coram.	unx.	Pass.	2	15
8.	Oregon R.R. & N.	Wyeth.	ms.	Pass.	1	2
12.	Hock'g Valley	Lemoyne.	b. rail.	Pass.	3	12
12.	Louis. & Nash.	Pocono, Ky.	ms.	Pass.	2	0
13.	Norfolk & West'n.	Delorme.	unx.	Ft.	2	1
14.	Kan. City So.	Noame.	d. switch.	Pass.	1	1
20.	St. L. & San Fran.	Olathe.	boiler.	Pass.	2	0
†21.	Erie.	Conant.	d. track.	Pass.	1	30
†23.	Chic., R. I. & Pac.	Clayton, Kan.	flood.	Pass.	16	13
24.	Del., L. & Westn.	Utica.	derail.	Pass.	1	0
30.	Northern Pac.	Missoula.	boiler.	Ft.	1	0

Other Accidents.

7.	Gulf & Int.	Seabreeze.	boiler.	Ft.	1	1
15.	Mo., Kan. & Tex.	Coffeyville.	boiler.	Pass.	2	0

The worst disaster in this record, that at Clayton, Kan., on the 23d, was due to a very unusual flood, caused by a cloudburst which occurred some distance from the line of the railway. This accident was reported in the *Railway Age Gazette* of September 30. All of the men of the train crew were killed except the rear brakeman and the porter.

The collision at Run Junction, Ohio, on the 6th, was caused by the running away of a locomotive. This engine, after a slight collision near Massillon, ran uncontrolled to Run Junction because it had been abandoned by its engineman.

[1] Abbreviations and marks used in Accident List:
rc, Rear collision——bc, Butting collision——xc, other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction—unx, unexplained ——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc.——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

Two of the accidents of this month happened to trains on which were officers of the road. At Lemoyne, Ohio, on the 12th, the superintendent of motive power of the road was killed; while at Delorme, W. Va., on the 13th, the president and the general manager of the road had a narrow escape when their special train ran off the track and wrecked the station building at Delorme. In this case a road foreman of engines and the locomotive runner were killed and the station agent was severely injured.

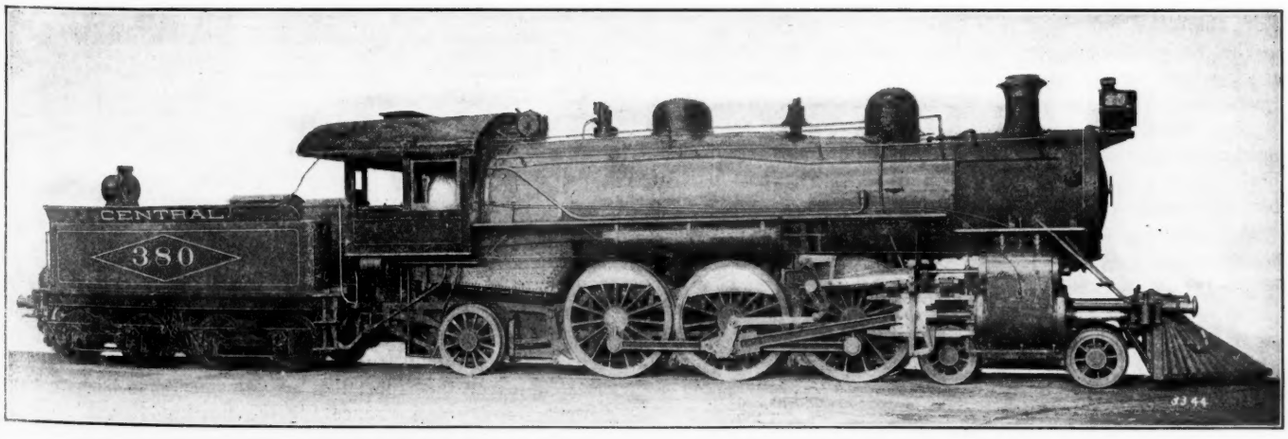
The trains in the butting collision at Holt, Mo., on the 16th, met on a high trestle, but fortunately neither the engines nor any of the cars fell through. The westbound train was No. 1 of the Rock Island road, which uses the Burlington tracks at this point. All of the passengers injured were in the smoking car of the Burlington train, which fell down a bank. It is said that a moment after the Burlington train had passed Holt, the agent discovered that it had no right to the road and he spent considerable time telephoning to farmers along the line in the hope of stopping the train, but he accomplished nothing.

The collision at Beech Ridge, Ill., on the 18th, was due to the non-delivery of an order to one of the trains, and the telegrapher was arrested on a criminal charge. The reports say that testimony was presented at the coroner's inquest to the effect that this telegrapher had been under the influence of intoxicating liquor. Another account says that this man was not the regular telegrapher at this place.

Of the 10 electric railway accidents reported in the newspapers as occurring in the United States in the month of September, four were attended with fatal resuts. Derailments due to misplaced switches occurred at Detroit, Mich., and Rochester, N. Y., one person being killed in each case. Near Tipton, Ind., on the Indiana Union Traction Line, a butting collision was charged with six deaths and six injuries; and at Bluffton, on the Fort Wayne & Wabash Valley Line, in the same state, occurred the great disaster reported in the *Railway Age Gazette* of September 23, page 563. In this 42 persons were killed and seven injured. The third one of the three electric-car disasters occurring about that time, happened in October (Staunton, Ill., October 4, on the Illinois Traction System).

PACIFIC TYPE LOCOMOTIVE; CENTRAL RAILROAD OF BRAZIL.

Two Pacific type locomotives, said to be the heaviest engines as yet shipped to South America by the Baldwin Locomotive Works, have recently been completed by that company for the Central Railroad of Brazil. The total weight is 189,100 lbs., of which 116,900 lbs. are on the drivers. The tractive effort is 29,130 lbs., making the ratio of adhesion 4.01. While a number of special details have been incorporated to suit the road's



Heavy Pacific Type Locomotive for the Central Railroad of Brazil.

standards, the design in general follows domestic practice quite closely.

The details of the superheater are shown on the drawing, the superheater pipes being located in 20 tubes, 5½ in. in diameter. These are grouped in four vertical rows. The superheated steam headers are connected transversely by an equalizing pipe, located in the bottom of the smokebox. Imported Cardiff coal is used for fuel. The grate is composed of 15 water tubes, running lengthwise of the furnace, and alternating with plain cast iron bars. The drop plates also extend lengthwise, and are placed at the center. A brick arch is supported on water tubes. The boiler is of the extended wagon top type, 66 in. in diameter at the front end and 75 in. at the dome ring. The crown of the firebox is flat and is supported by T-bars hung on expansion links.

The steam distribution is controlled by inside admission piston valves, 12 in. in diameter, which are placed with their centers 5⅛ in. outside the cylinder centers. The links are placed outside the leading driving wheels and are mounted on cast steel bearers, which serve as supports for the reverse shaft bearings also. In accordance with the road's practice, the Belpaire combined screw and lever reversing gear is used. The valves are set with a constant lead of ⅛ in. The cylinders are placed 90 in. between centers and are lined with hard bushings ⅝ in. thick. Both the piston and valve rods have front extensions.

The engine frames, driving boxes and driving and engine truck wheel centers are of cast steel. Phosphor bronze hub liners are used on the driving wheels. The rear truck is of the Rushton type, with inside journals. Automatic air brakes are used on the driving and tender wheels, and the le Chatelier water brake is applied to the cylinders. The tender frame is built of 8-in. channels, and the trucks are of the equalized pedestal type with forged and rolled steel wheels.

The principal dimensions and ratios are as follows:

General Data.

Type	4-6-2
Fuel	Cardiff coal
Gage	5 ft. 3 in.
Tractive effort	29,130 lbs.
Weight in working order	189,100 "
" on drivers	116,900 "
" on front truck	36,600 "
" on rear truck	35,600 "
" of engine and tender in working order	258,000 "
Wheel base, driving	11 ft. 8 in.
" " total	30 " 4 "
" " engine and tender	55 " 1 "

Ratios.

Total weight ÷ tractive effort	6.49
Weight on drivers ÷ tractive effort	4.01
Tractive effort × diam. drivers ÷ equiv. htg. surface.*	534.20
Total equiv. heating surface* ÷ grate area	86.23
Firebox heat'g surf. ÷ total equiv. htg. surf.,* per cent.	4.15
Weight on drivers ÷ total equiv. heating surface*	31.52
Total weight ÷ total equiv. heating surface*	50.99
Volume both cylinders, cu. ft.	11.76
Total equiv. heating surface* ÷ vol. cylinders	315.30
Grate area ÷ vol. cylinders	3.65

*Equivalent heating surface = evaporating heating surface (2,762 sq. ft.) plus 1.5 times the superheater heating surface (631 sq. ft.) = 3,708 sq. ft.

Cylinders.

Kind	Simple
Diameter	21½ in.
Stroke	28 "

Valves.

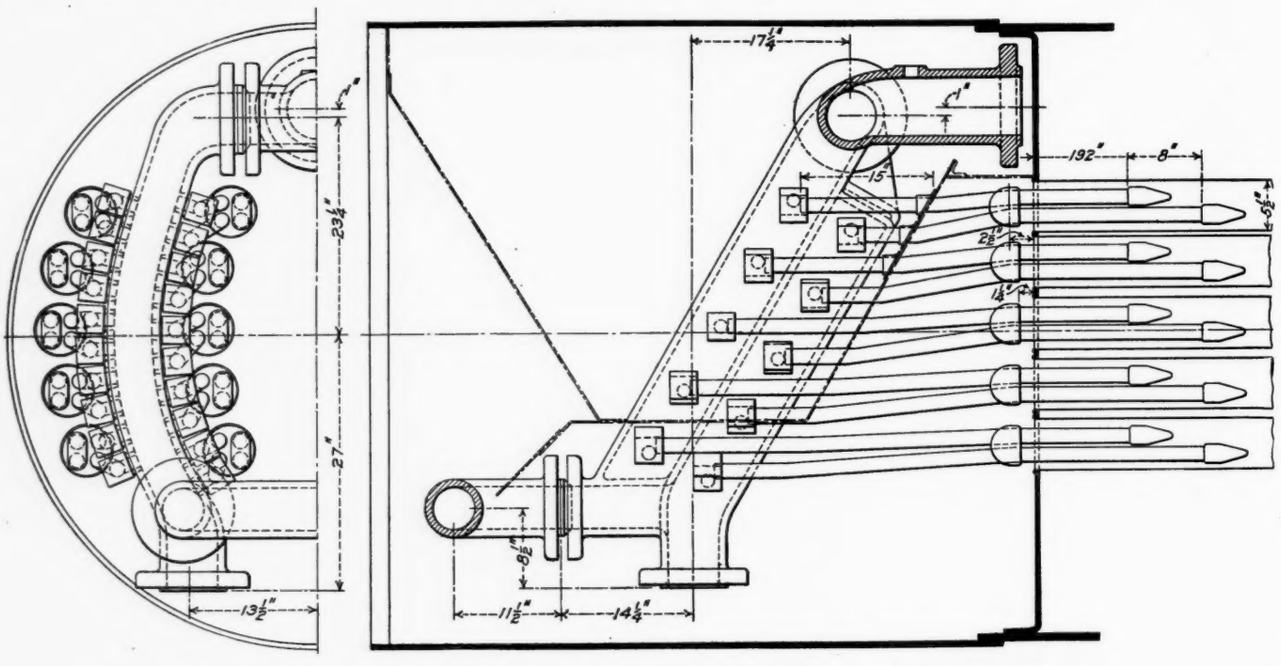
Kind	Balanced piston
Diameter	12 in.

Wheels.

Driving, diameter over tire	68 in.
" thickness of tire	3 "
" journals	9 x 12 in.
Engine truck, diameter	30½ in.
Engine truck, journals	5½ x10 "
Trailing truck, diameter	42 "
Trailing truck, journals	7½ x 12 "

Boiler.

Style	Wagon top
Working pressure	180 lbs.



Superheater on the Pacific Type Locomotives for the Central Railroad of Brazil.

Outside diameter of first ring	66 in.
Firebox, width and length	66 x 94 "
" depth, front	67¼ "
" depth, back	55 "
" plates, thickness...C., ⅜-in.; T, ½-in.; S. & B., ⅜-in.	
" water space ...F., 4 in.; S. & B., 3 in.	
Tubes, number and diameter	20, 5½ in.; 210, 2 in.
Tubes, length	18 ft. 9 in.
Heating surface, tubes	2,591 sq. ft.
" " firebox	154 "
" " superheater	631 "
" " firebrick tubes	17 "
" " total	3,393 "
Grate area	43 "

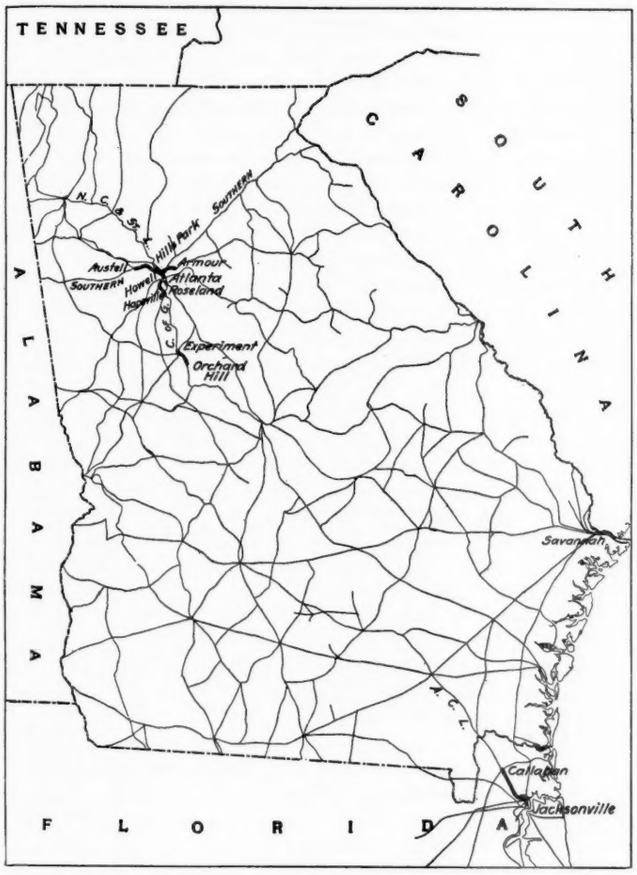
Tender.

Wheels, diameter	36½ in.
Journals	4¼ x 8 "
Water capacity	3,000 gals.
Coal capacity	7 tons

Press despatches from Paris say that it has been officially stated that the French loan to the Turkish Government had not been as yet definitely consummated. An official note issued at Paris confirmed the report that an agreement had been reached between Turkey and France for the floating of a $30,000,000 loan in the French capital. The note added that France had obtained the guarantees demanded from Turkey.

DOUBLE TRACK RAILWAYS IN GEORGIA AND FLORIDA.

The railway map of Georgia given herewith is printed for the purpose of showing all sections of railways in the state on which there is more than one main track. The termini of the sections are as shown in the table below. In the state of Florida we can find only two places where there is a double track. One of these is on the Atlantic coast line between Callahan and Jacksonville—21 miles. This is shown on the map now presented. The other section is from Goulding to



Double Track Railways in Georgia, and Part of Florida.

Peninsula, on the Louisville & Nashville. This will be shown in connection with the map of Alabama. No map of Florida will be printed.

GEORGIA.

	No. tracks.	Approx. miles.
Atlantic Coast Line.		
*Fairfax Junction to Union Junction	2	..
*Southern Junction to Savannah	2	..
Central of Georgia		
Atlanta to Hapeville	2	9
Experiment to Orchard Hill	2	7
Southern.		
Roseland to Austell	2	21
Howell to Armour	2	3
Nashville, Chattanooga & St. Louis.		
Atlanta, Ga., to Hills Park	2	5

*Not shown on map.

RAILWAY BUILDING IN SIAM.

The southern line of the Royal Siamese State Railway is now in course of construction. With rapid work it is expected to complete the line in five years. A contract for bridges of structural steel amounting to about $30,000 has just been awarded to a British firm, without any public tenders having been had therefor. This is sufficient material to bridge the 250 miles of railway already under construction. It is estimated that structural bridge steel will be required for the remaining bridges to the value of $125,000, but it is intimated that they will all be ordered from the same British firm. Before next June 20,000 tons of rails and 2,000 tons of fastenings such as bolts, etc., will be required, and these will probably be put to public tender. Within two years locomotives and rolling stock will be asked for.

TRANSPORTATION AND TRAFFIC IN AUSTRIA-HUNGARY.*

BY LOGAN G. M'PHERSON.

Between the developing countries of northern Europe and the backward Balkan states lie Austria and Hungary, inhabited by a mixture of races whose coalescence continues to be a slow and laborious process. Of manufacturing in general, the making of glass, cotton and woolen goods and machinery, there is a good deal in Bohemia, the Austrian province that borders Germany, but the most of this country, as well as nearly all of Hungary, is devoted to agriculture, the raising of the grains and of livestock, and to the production of lumber from the extensive forests. These conditions imply a less advanced stage of industry and commerce than is to be found in Germany, France or Switzerland, and therefore a less highly developed system of transportation.

The Danube extends through Austria and Hungary to the Black Sea. The Moldau is also a principal river of Austria; in Hungary are the Tisza, the Drava and other rivers. Of all of these a marked characteristic is that they carry but little sediment in suspension. Both countries, especially Hungary, of which nearly one-half during an earlier geological era was a great lake, were long subject to frequent and excessive inundations from overflows. These have been prevented and facilities for navigation enhanced by the regulation of the streams, that is, by the building of rigid walls to confine their currents and by the making of cuts through bends to render the channels less tortuous.

The first expenditure in the line of such improvement seems to have been upon the Moldau as early as 1640. Further expenditures, of which there is no definite record, were made upon one river and another during the next two hundred years, but a comprehensive plan for the improvement even of the Danube was not entered on until 1860, four years after the tolls on that river had been abolished by the treaty of Paris. The rivers in both Austria and Hungary are now nearly all regulated.

The principal river improvement in Hungary has been the clearing of the channel of the Danube at Orsova through a series of formidable rocks known as the Iron Gates, which caused rapids and cataracts that were a menace to navigation.

There has not been a great deal of canal construction in either country. A canal was built through Vienna from one point on the Danube to another point in 1867, and in one or two places access to the Adriatic was facilitated by the construction of canals. A canal projected to connect the Moldau with the Danube has been completed to a length of 56 miles, and another from Parkowitz to Melnik for a distance of 80 miles. In Hungary the Francis Canal was built between 1840 and 1850, but is now little used. The only really serviceable canal in this country at this time is that with a reach of 88 miles connecting the Danube and the Tisza. It occupies the channel of a very old canal whose resuscitation has cost about $40,000 a mile. During the 40 years beginning with 1867 the Hungarian government appropriated over $48,000,000 for the improvement of waterways and over $5,250,000 for the maintenance of existing construction. In 1908 it voted an additional $39,000,000 to be used in yearly instalments of $1,500,000. Dykes in the lowlands, constructed by associations of landowners at a cost of about $71,000,000, have been placed under government supervision which grants them an annual subsidy of about $1,200,000. At this time only

*A preliminary report to the National Waterways Commission.

about 50,000 acres of Hungary remain subject to serious floods, and the various cuttings have reduced the total length of the rivers by 1,065 miles.

The total length of rivers and canals in Austria navigable for steamers is 830 miles, for barges and rafts an additional 3,370 miles, and for rafts only an additional 2,400 miles, or 6,600 miles in all. In Hungary 1,924 miles are navigable for steamers and an additional 1,165 miles for small boats and rafts. Steamers along the Tisza, the connecting canal and the Danube carry grain from Hungary to Vienna, but have little return loading, obtaining only a small share of Austrian and German manufactures for Hungary, the Balkan States and Turkey. By far the greater use of the tributary streams of both countries is for the conveyance of rafts of logs and lumber. The only ports of either country are on the Adriatic, Trieste in Austria and Fiume in Hungary, and these are accessible only by rail.

Neither Austria nor Hungary charge tolls for the use of the inland waterways, with the exception that Hungary by international agreement is permitted to charge tolls for the use of the channel made by it through the Iron Gates, which is of benefit to the commerce not only of Hungary but to that of Austria and the Balkan states. In Austria the entire capital, expenditure and expense of maintenance was formerly borne by the national government, but now it compels the cities and the provinces to participate. In Hungary the entire capital and maintenance expenditure is borne by the state. Moreover, the two national lines of steamers on the Danube receive an annual subsidy of 800,000 florins ($400,000) each, for which their only obligation is to devote the boats to the use of the government in time of war. The canal in Hungary connecting the Tisza and the Danube is, however, controlled by a private company under the supervision of the government. It charges tolls which permit it to pay 1½ per cent. interest to the bondholders. A transport tax charged in Hungary on the rivers and canals was maintained by the government for a period of about 16 years, but the revenue was turned into the general budget. This aroused complaint from the water carriers, which led to the abolition of the impost. The boats that ply on the streams of both countries are mostly paddle-steamers and modern barges owned principally by companies.

Many projects for the extension of canals have been discussed for several years, both in Austria and Hungary, and definite plans and estimates have been made for certain of the projects. The whole matter is subject to the exigencies of politics and buffeted one way and another as one party or another comes into power.

The first concession for a steam railway in Austria was given on March 4, 1836, for a line from Vienna to Gallicia, which was opened in 1837. The next concession was in 1839 for a line from Vienna to Raab and Gloggwitz. These were built by private capital, but the concessions reserved the right to the state to take over and work the lines. By 1840 90 miles had been placed in operation, which did not prove profitable, and requests were made on the state for assistance. The government perceiving that private capital could not be relied on for building an adequate railway system, adopted, on December 19, 1841, a program for the construction of a network of state railways. This comprised a line from Vienna by way of Prag to the Saxon frontier at Bodenbach, and another from Vienna to Trieste on the Adriatic. The construction of small short lines was left to private companies.

The operation of the private lines continued to be unprofitable. The state extended aid by the purchase of shares, incurring an expense for this purpose that by the end of 1848 amounted to 26,000,000 florins ($13,000,000). The government thereupon adopted the policy of taking over all of the lines. This brought heavier burdens than anticipated. The receipts of the railway taken over did not meet expectations; and the political situation, in which a factor was the necessity of obtaining money for general purposes, led to a further alteration in the railway status. Under the belief then held that projected lines would be carried to completion more rapidly by private companies, a new law was enacted on September 14, 1854, which lengthened the duration of the concessions from 50 to 90 years, but also retained for the government a large share of influence in the administration.

A number of new companies were formed, largely by the aid of foreign capital, and in 1858 the state lines, aggregating at this time 1,488 miles, were taken over by the private companies. Notwithstanding the financial crisis of 1857 and the depression caused by the war of 1859, the railways of Austria rapidly extended until the commercial crisis of 1873 not only brought an end to the subscription of private capital for further construction, but involved the existing lines in great pecuniary difficulties. A number of derelict concessions were canceled, construction under way was abruptly terminated, and the private companies made heavy demands for assistance, which the government was obliged to grant. The following years were a period of transition. The unwillingness of financial circles to participate in railway operations and the necessity of constructing useful lines, as well as the constant effort to ameliorate the bad condition of the workmen, caused the commencement of a new era of direct participation by the state in construction and operation. In 1876 it entered on the construction of a number of small lines, and was soon obliged to take over several private lines that were hopelessly involved. This policy has continued until in 1906, when of the 13,388 miles of railway in Austria the state operated 67.95 per cent.

In Hungary the first railway was built in 1846, but development was not rapid. The first construction was by private companies, but the state had given guarantees of which it was called on to perform to such an extent that nationalization was here also entered on, and it has continued with even greater progress than in Austria. Of the 12,951 miles in Hungary in 1908, 83.5 per cent. were worked by the state. In these percentages given in either country as of lines worked by the state are included both the lines owned directly by the government and the lines operated by it on behalf of private companies. Concessions for new lines are still made in either country, but under strict requirements, and they are not being availed of except for lines of secondary importance.

The following memoranda as to the operation of the railways of Austria and Hungary is taken mainly from the report of the Board of Trade Railway Conference of England, which has made expert investigation of the status of the railways of several countries of the continent.

"The state railways in Austria are under the control of the minister of railways, an office first instituted in the year 1896, previous to which the railways were a separate department of the ministry of commerce. The minister is not a permanent official as in Prussia, but is appointed by and changes with the government. In Hungary, on the other hand, the head of the state railway is a permanent official responsible to the minister of commerce.

"Common to both countries are the regulations appertaining to the transportation of passengers and goods and the regulations for the conduct of traffic, both of which correspond to the regulations issued under a similar title in Germany.

"The financial control is in the hands of the state financial department, whose budget, as far as its railway estimates are concerned, must be prepared in conjunction with the railway authorities."

In Austria the executive administration is decentralized through 13 "Directions." In Hungary, under the permanent official, known as the president, are the officers in working control of the nine districts. Matters of general importance must be discussed in general conference with the ministry. In Hungary the finance minister is represented at the conferences.

The jurisdiction of the state over private railways covers construction, maintenance, the type and amount of rolling stock, passenger and goods tariffs, time-tables and, in the case of guaranteed lines, large financial control.

There are advisory councils, similar to those of Germany, in both Austria and Hungary, but their influence is not important, the final determination of all questions resting with the ministry.

The records of the finance department in Austria show that the railways produce an annual deficit, but it is claimed that the advantages to the trade of the country from the low price of transportation have been vast. Additional revenue, however, is imperatively required. The raising of the tariffs would appear to offer the most ready means, but this is inopportune. The state lines have resorted to certain subsidiary charges, and increases are proposed in the stamp duties on waybills. These projects have all been violently opposed by the shippers, but the finance ministry insists that the expenditure of the state railways ought at least be covered by their receipts.

The conditions in Hungary are entirely similar. The government a few years ago proposed a general raising of the tariffs, but met with such a storm of opposition that the matter had to be deferred. In both Austria and Hungary there is urgent need of extensions and improvements of the railways and in both countries political influence is extremely strong because of the various nationalities concerned, great pressure being brought to bear on the party in power by the people of each province in behalf of their own interests. With such demands the ministry is very often obliged to comply. The difficulties arising from the federation of so many nationalities is instanced by the fact that any new rule or regulation has to be published in seven different languages.

The tariffs in both Austria and Hungary are complicated, but the system of tapering rates is common to all the railways. The primary tariff scheme, broadly speaking, is similar to that of Germany, but there are many intricacies.

The "Ausnahme," or exceptional tariffs, are more liberal in their application than those of Germany, modifications from the regular tariffs being made because of the "competition between two or more railways with respect to traffic to or from the same district; competition with waterways and landways; competition for the purpose of securing traffic for a special port; competition of several districts of production for one specific district of consumption; to counteract the disadvantages of geographical situation; to assist the agricultural and general industry to secure new markets with a view toward insuring a continuous and increasing traffic."

It would seem obvious that this greater liberality in Austria and Hungary in the way of "Ausnahme" tariffs is due to the fact that the rail traffic has been largely developed by private companies which have adjusted their tariffs to meet commercial conditions, and that because of the slower progress of governmental control these practices have not been transformed into that rigidity which is characteristic of Germany. In Austria and Hungary experimental rates are also accorded, largely under agreements to pay rebates on shipments that exceed a certain specified quantity. Special rates are given on traffic for export, but as a rule the ordinary tariff rates apply on import traffic.

As the railways of neither Austria nor Hungary make collection or delivery of hipments, "spediteurs" exist in both countries as in Germany. A very large percentage of the traffic passes through their hands, and every inducement is given them by the rail authorities. The principle of "lumping" small shipments to obtain the carload rate is permitted and encouraged.

In both Austria and Hungary, as in Germany, are supplementary charges consisting of stamp taxes on waybills and other forms; charges under certain conditions for loading and unloading, for transferring goods, for cranage, for weighing, and for counting the packages in a wagon load; and in Austria there is a station charge in addition to the terminal charge specified in the regular tariffs.

As in Germany, the railways take refuge behind the cast iron stipulations of the waybills, settlement of claims for goods lost or damaged in transit being very difficult and in most cases impossible to obtain.

The state control has reduced competition between the railways of both countries to a minimum. There is, however, a certain competition with the waterways over whose rates the government exercises no control. In winter when the waterways are closed to traffic, there is an increase in the rail rates on certain traffic for which, in summer, the railways compete with the waterways. In Hungary the railways have been so successful in competing with the waterways that the water-carrying interests have petitioned the Hungarian government to so revise the railway tariffs that this competition will be ineffective.

To meet the low rates which the German state railways make to induce traffic from the interior for the Levant to move by way of Hamburg, the Austrian railways make a special reduction to secure such traffic by way of Trieste.

In both Austria and Hungary in many places the zone system is adopted for passenger traffic. This is a tapering tariff which radically decreases between one zone and another, the extent of the respective zones being from about 100 to 200 miles.

This system was first introduced in Hungary in 1889 for the express purpose of building up the capital of Budapest, the tapering scale not applying from any interior station by way of Budapest to a further interior station. The object was to induce the people of the interior of Hungary to visit the capital with frequency and to make purchases there. It undoubtedly has contributed in great measure to the desired purpose, but it has had a disastrous effect on the revenues of the railways, who have sought to increase their receipts by the imposition of a transport tax on passengers and luggage which amounts to 18 per cent. of the transportation charge. For the same reason the zone system was proposed for freight traffic, but the project did not meet with successful operation, and it has been nearly abandoned.

On certain lines in both Austria and Hungary a passenger, on the payment of a fixed charge for a certificate known as "Legitimation" may thereafter purchase tickets at half the ordinary fares. This Legitimation charge for first class is $64; for second class, $38; for third class, $24.

It is useless to attempt a comparison of the traffic by rail and that by water in these countries. The statistics, especially those of the waterways, are admitedly not in a high state of development.

UNLOADING COAL WITH BALLAST SPREADER.

The Atchison, Topeka & Santa Fe is using a novel method of unloading coal for winter storage in its Chillicothe, Ill., yards. Two parallel spur tracks were laid adjoining the coaling station and the coal is being dumped on these tracks from Hart convertible cars. A switch engine and three trainmen are employed in handling the cars to be dumped, and from 40 to 50 laborers in raising the track by filling in the coal. The most novel feature of the work consists in the use of an ordinary ballast spreading car to plow the coal from the track. The switch engine picks up one of the 40-ton dump coal cars, couples it to the spreading car and pushes them down to the end of the spur track. The center dump doors are opened and the engine backs out, the coal dropping down on the track and being pushed over the rails by the ballast plow. This operation is repeated until the coal is piled on each side of the track as high as the plow will push it. Then the laborers are brought on and the track raised above the level of the coal. The use of two tracks allows the track-raising gang to work on one track while dumping is going on on the other. Mexican laborers were available for the track raising, as they are employed extensively on construction work along the line. Four of them ride on the car which is being dumped and push the coal through the doors with long poles. In an average day's work of 10 hours, it is possible to unload from 1,200 to 1,500 tons of coal by this method, making a low per ton cost. In case the coal is needed during the winter, a steam shovel is used to load it on cars to be run up in the coaling station in the usual way. The width of the pile is such that a shovel can clean it up with one cut.

General News Section.

The Minnesota, St. Paul & Sault Ste. Marie will open, on the 6th of November, its line between Duluth and Winnipeg, by way of Moose Lake, Bemidji and Plummer.

The semi-annual meeting of the Central and Western Association of Car Service Officers was held at Des Moines, Iowa, on October 22. Various subjects relating to the proper handling of cars were discussed and a dinner was given in the evening.

The first passenger train over the new bridge across the Rio Grande at Brownville, Tex., was run on October 20. The train bore a party of officers of the Kansas City, Mexico & Orient, who, with a large number of visitors from the East and from Europe, were bound for the City of Mexico.

The Pennsylvania will shortly have available for use on its lines east and west of Pittsburgh and Erie 1,988 solid steel passenger train cars. This includes some 600 Pullman parlor and sleeping cars, as well as a large number of suburban coaches such as the company's shops are just beginning to turn out.

Lawyers of a large number of prominent railways met in New York this week to discuss the interpretation of the Mann-Elkins act, and to confer on the question of testing the constitutionality of this law. The conference was called by Mr. Stone, of the Louisville & Nashville, and it continues the discussion that was begun at Portsmouth, N. H., last summer.

In a fire at East St. Louis on October 20 the freight house of the Chicago & Alton, together with other buildings adjoining, was completely destroyed; total loss estimated at $500,000. The flames were spread by the explosion of ten tank cars filled with oil, making the fire uncontrollable for a considerable time. There was also a large loss at the Baltimore & Ohio freight house.

The Northern Pacific will issue no more passes in Montana except to employees. This is owing to a recent decision of the Supreme Court of that state in the case of Johns, riding on a pass, who was thrown from a sleeping car berth and received injuries. He sued the road, and was awarded $25,000 damages, the court holding that the road had violated the law in allowing him to ride free and that he was, therefore, not bound by the usual provision on the pass.

J. T. Harahan, president of the Illinois Central, stated at Chicago last week that he expects to retire under the pension system of the road on or before January 12, 1911. Mr. Harahan was born at Lowell, Mass., on January 12, 1841, and, therefore, on January 12, 1911, he will have reached the maximum of 70 years, at which retirement is provided for by the pension regulations of the Illinois Central. It is understood that the place of chairman of the board will be created and that Mr. Harahan will be appointed to it.

E. P. Griffith, superintendent of telegraph of the Erie Railroad and chairman of the committee in charge of the project to erect a monument at Turner, N. Y., to commemorate the first telegraphic train order, has sent out a circular inviting subscriptions. This proposition was laid before the readers of the *Railway Age Gazette* in connection with the last annual meeting of the Association of Railway Telegraphic Superintendents. Mr. Griffith says that architects' sketches have been submitted showing that a suitable monument can be made for $3,000. The Erie is now building a new station at Turner and it is proposed that the monument shall stand on or near the site of the old station. Contributions should be sent to J. B. Taltavall, 253 Broadway, New York City.

The progress which has been made in the art of flying since Wilbur Wright first flew, in 1903, is illustrated by the tournament which has been held during the past week at Belmont Park, near New York City, where the exhibitions have been carried out with a regularity approximating that of a horse race, and where four aeroplanes have been in the air at the same moment during the greater part of the exhibition, which is from 1.30 p.m. to about five o'clock. At times the reporters have counted ten machines flying at once. For the first five days the program was adhered to quite closely, except on one day when the wind blew at 35 miles an hour and higher. Up to the end of the fifth day no important records had been broken, and no bones were broken, either. One slight accident was reported. On Tuesday Ralph Johnstone, in a Wright biplane, rose to a height of 7,303 ft. (1.38 miles), and other men had been nearly as high on preceding days. On Tuesday also, Orville Wright, using a new biplane (the smallest in the world), made the circuit of 2½ kilometers (1.55 miles) in 1 minute, 26 seconds, which is said to be within two seconds of the best time ever made over such a course. This was an informal trial, early in the morning. James Radley flew to Hicksville and back (20 miles out and back) in 19 minutes, 48 seconds.

From the Wall Street Journal.

"As advertised," the annual meeting of stockholders of the Northern Pacific Railroad Co. was held this afternoon [October 20]. The entire attendance at the meeting was the proxy committee of one. He cast a ballot for Temple Bowdoin, David Crawford Clark, Stephen Baker, E. A. Gay, H. P. McCullough, A. H. Gillard, P. P. Hamilton, W. B. Horn, Samuel E. Kiiner, Charles W. King. Charles MacVeagh, Francis L. Stetson and John F. Talmage, who composed the old board of directors. On counting the vote he found these men elected.

The Northern Pacific Railroad Co. was succeeded by the present Railway after the foreclosure in 1896. A few of the old stockholders declined to pay the assessment required for an exchange of shares of the old company for those of the new, and when the reorganized road grew prosperous, they attempted to realize something on their shares. They maintained that in the reorganization, title to the Railroad Company's land grants did not pass to the Railway. Attempts were made to secure legislation in Congress declaring this the case and the matter was carried through several courts, being decided in favor of the reorganized company in each instance. For the past three years holders of the old stock have made no effort to compel the Northern Pacific to buy their stock or reimburse them in other ways.

The Railways and the Woolen Trust.

On clothes manufactured in New England and sent to Chicago the railway freight would be 3¾ cents, and the advance proposed by the roads is exactly three-quarters of a cent on each suit.

Of course this is an addition to the cost of production, using that phrase in its widests sense. Such a sum, trifling in a single article, becomes appreciable spread over the individual's entire year's expenditure, and is positively enormous when applied to all the articles of consumption of a population of ninety million people. Having said this, it must be admitted that, badly as the railways bungled their own case in the freight rate hearings the pleas of the shippers were to a great extent distinguished by the most insufferable cant. So far as the ultimate consumer is concerned, he only enters into the calculations of the shipper in regard to the extent to which he can be held up. As we have shown, the unconscionable railways take 3¾ cents of the cost of his suit of clothes at Chicago. The tariff-protected woolen trust is enabled to take three hundred times that amount out of the consumer's pocket, by selling him something which he would not dream of accepting in that state of free competition which he demands for the railways.—*Wall Street Journal.*

Despatching by Telephone on the L. & N.

The Louisville & Nashville has just completed the installation of telephone train despatching and message circuits on its Knoxville division. There is a despatching circuit from Knoxville to Corbin, 105 miles, and one from LaFollette to Etowah, 114 miles, and a message circuit from Corbin to Etowah, 163 miles. This last has 36 stations. The equipment is all from the Western Electric Company. The cost of equipping this division was $36,000. The power furnished for operating the selectors and ringing the bells is obtained from motor generator sets. These

sets are operated directly from the primary sources of power available, and on alternate days, so that the sets are always in an operative condition. They are arranged so that it is possible to connect all of the offices to either the train wire or the message circuit. There are test panels at all stations, making it possible to patch the despatcher's line with parts of the message circuit in case of trouble. Work trains on this division will be equipped with portable telephone sets and "fish poles" so that the conductors can at any time get in immediate touch with the despatcher.

Some History of Telephone Train Despatching.

The New Orleans & Northeastern, as early as 1883, used the telephone for operating trains. This was on a grounded iron wire about 100 miles long. Other roads using the telephone for controlling train movements previous to 1907 are: Huntingdon & Broad Top Mountain since 1883, 45 miles; New York & Pennsylvania Railway since 1896, 57 miles; Chicago, Kalamazoo & Saginaw since 1890, 56 miles, and Lake Erie, Alliance & Wheeling, 100 miles. The telephone has been used in manual block signaling on the freight line of the Pennsylvania between Columbia and Parkesburg since 1906.

The New York Central was the first to install the Western Electric improved equipment in October, 1907, on the main line between Albany and Fonda, 44 miles. Others were: The Chicago, Burlington & Quincy, December, 1907, Aurora to Mendota, 46 miles; Aurora to Galesburg, 125 miles; Aurora to Clyde, 28 miles. These Burlington installations were all double track, but reverse movements were made, and next that company equipped a single-track section between Aurora and Savanna, 106 miles. Following these pioneers others rapidly adopted the telephone and now we have the following list of roads, each having telephone circuits covering over 1,000 miles. These figures include in most cases equipment installed and under construction both on train and message circuits:

	Miles.
Atchison, Topeka & Santa Fe	6,083
Lake Shore & Michigan Southern	2,000
Pennsylvania Railroad (East of Pittsburgh)	1,407
New York Central (including Boston & Albany)	1,255
Cleveland, Cincinnati, Chicago & St. Louis	2,500
Illinois Central	2,100
Canadian Pacific	1,694
Great Northern (will eventually have)	6,000
Chicago, Milwaukee & St. Paul	1,300
Louisville & Nashville	1,261

In addition to these there are 47 roads which have one or more telephone train despatching circuits in operation, making the total length of road covered approximately 35,000 miles. The Lackawanna is the only road that has installed telephone and selector equipment over practically its entire system. This road, out of a total of 957 miles, has equipped 933, on which there are 271 stations.—*From a paper by G. K. Heyer.*

Precautions Against Fire at Pennsylvania Station.

A firewall stretching across Manhattan island from Ninth to Seventh avenues has been completed by the construction of the Pennsylvania station and adjacent buildings. The full fire protection system of the station has just been put into operation and insurance engineers say a conflagration such as was experienced in Baltimore and San Francisco is now an impossibility in that part of Manhattan.

The Pennsylvania station covers over 28 acres, with three levels below the main floor, the lowest being 36 ft. below the street line. About three miles of piping, weighing 425 tons, was used, and there are 117 hose connections, 24 roof hydrants and 12 flush hydrants. The plans provide for maintaining 12 standard fire streams, or 3,000 gallons a minute. There are two 1,500-gal. Blake pumps in addition to the 16-in. suction from two storage tanks, having a total capacity of 75,000 gals. The pumps and tanks are in the station service plant, a separate building on the south side of 31st street. The supply pipes throughout are carried in pipe subways which encircle the entire station area. The pipes are carried on transverse cast iron hangers supported from steel girders, readily accessible for inspection or repairs.

In the track level area there are 23 hose connections on train platforms and 12 fire hydrants in the yard west of the station building. Hand chemical extinguishers have been provided in the corridors of the upper floors and at other points throughout the station, comprising in all 75 three-gallon extinguishers. In addition, there will be 33 extinguishers of the non-freezing type placed in column recesses on the track level floor, where freezing conditions may exist. For the station building there will be in addition to the equipment specified a 500-ft. reel hose carriage and a 60-gal. chemical engine. The total equipment of 2½-in. fire hose for the station exceeds 15,000 ft.

A complete closed circuit fire alarm system covers the entire station and service plant. There are in all 20 boxes of the non-interfering successive type, wired in loops of 10 stations each, recording on three gongs, located under main concourse, yardmaster's office and station service plant. The fire brigade organization comprises 25 men, divided into three companies.

For the tunnel alarms (for transmitting signals indicating fire and for cutting off current to the power rails) there are 116 boxes divided into six circuits, each box having two levers, one marked "Power" and the other "Fire," the "Power" lever automatically cutting off all power current in the section directly affected. This signal consists of two rounds of the box number. The "Fire" lever also automatically cuts off the power current and is indicated by four rounds of the box number.

The watchmen's service is recorded on two portable watchman's clocks from 38 stations, and provides for hourly tours. At the present time there are two watchmen.

History Condensed (and ex Parte).

The governor of Texas, replying to a telegraphic inquiry from the governor of Idaho last week, said: "Railway commission law is entirely beneficial to Texas. Railway mileage has increased from 10,110 to 13,855 under commission regulation. About 740 new miles built during the year ending June 30, 1910. Largest construction in our history. Rebates and discriminations practically unknown. Progress of state materially advanced by railway commission."

Launching of the Olympic.

The new White Star steamship Olympic, 882 ft. long, was launched at the yard of Harland & Wolff, Belfast, Ireland, on October 20. The Titanic, a sister ship, will be launched next February. These vessels, nearly 100 ft. longer than the Mauretania, have 45,000 tons register, 66,000 tons displacement, and a beam of 92 ft. They are designed to make a speed of 21 knots an hour.

Grade Crossings in New York.

The New York Public Service Commission, Second district, proposes to secure the abolition of as many highway crossings in the state during the current year as can be abolished within the appropriation which was made by the last legislature for this purpose—$350,000. This appropriation means the expenditure of $1,400,000, approximately, for this work. The commission now has on its docket 17 applications for the elimination of crossings; and there are 38 more applications which will be taken up as soon as the legislature makes a further appropriation.

The Boston & Maine and the New Hampshire Legislature.

In an address at Concord, N. H., last week, President Charles S. Mellen, referring to the future policy of the Boston & Maine in that state, said: "We will not interfere in any way with the election of members of the legislature or of other public officers. We shall not give or offer to any public officer, directly or indirectly, any consideration which shall tend to influence him in the performance of his public duties. We shall do away with the lobby, in the sense in which that term is commonly used. We must, however, employ the ablest talent we can secure to present to the legislature our views upon pending legislation affecting our company. I find two great lawsuits in progress between our company and your state officials. The first is the rate case [heretofore reported]. The second is the tax suit. The railway should pay its full tax under the law, but its taxes should be assessed as are other taxes in the state, on the same basis of valuation. * * * It is my opinion that the present taxes would never have been assessed had not prejudice and a desire to punish had a greater influence than a desire to be just."

The New York *Journal of Commerce*, commenting on the foregoing, says: "This is a salutary state of mind which is the apparent result of a long contest in New Hampshire, to which

at least two popular novels have been devoted by a well known writer sojourning at Cornish. It has produced an example that other railways in other states would do well to follow. If they will withdraw their corrupting influence from politics and refrain from subtle methods of affecting legislation and administration, it will go far toward disarming that hostility of which they have been complaining."

Strike on Missouri Pacific.

The members of the boilermakers, blacksmiths and pipemen's unions employed on the Missouri Pacific and the St. Louis, Iron Mountain & Southern went on a strike on October 21. These employees struck out of sympathy with the machinists who had already struck. When the machinists went out their foremen went with them. A. W. Sullivan, general manager of the Missouri Pacific and the Iron Mountain, gave out a statement on October 20, in which he said that "there were now no material differences between the Missouri Pacific and the machinists except over the reinstatement of the foremen." The machinists insisted on their reinstatement, which was refused. Mr. Sullivan added:

"The right of the railway company to select its officers of whatever rank, including foremen, is one which cannot be relinquished to a labor organization, while the company is held to responsibility for the safety and efficiency of its service.

"The action of the other labor organizations to coerce the railway company into compliance with the machinists' demands by threats of a sympathetic strike, in violation of their contract agreements, entered into since the machinists' strike was declared, cannot be permitted to influence the company in its determination to maintain control of its business through its own official organization."

Representatives of the employees in a public statement said that if the trouble with the Missouri Pacific and Iron Mountain is not adjusted within a reasonable time they will take steps to "bring to bear the influence of all members who are employed on the railways known as the Gould lines." Of course, this is a threat to cause a strike on the other Gould lines.

Forest Fire Losses.

A rough estimate of the fire loss in the national forests in Montana and northern Idaho, made by the Department of Agriculture, puts the total amount of timber killed or destroyed in this one district at: over six billion board feet, while the area burned over is put at over 1¼ million acres. A large part of the losses on the Coeur d'Alene, Clearwater, and Lolo forests were due to what became practically one great fire. The burn is shown on the forest service maps as extending in a northwesterly and southeasterly direction from north of Wallace, Idaho, to a point some 30 miles southwest of Missoula, Mont., or nearly 100 miles. At its widest point this burn has a width of about 40 miles, but its shape is very irregular. It was really a union of a number of separate fires, driven to fury by the fierce hurricane of August 26. To the west of the Idaho-Montana boundary in the region of this fire lies a very inaccessible mountainous country, into which, on account of the absence of trails and of forage, it was almost impossible for forces of fire fighters to penetrate. When the hurricane arose it drove the fires upon the parties which were hewing a way towards them, forced these parties to seek refuge wherever it could be found, and swept down upon the forests where the fires were up to that time generally well in hand. The extensive losses are ascribed to the combination of hurricane and lack of means to get to the fires and put them out before the storm came. On the forests which were best equipped for controlling fires the results achieved are regarded as a demonstration of the efficacy of the fire-fighting methods employed, even under highly adverse natural conditions. Forester Graves believes that, as usually happens in the case of big fires, there will be found to be considerable areas of living timber within the regions now mapped as entirely burned over. There will be an enormous quantity of fire-killed timber, both on the national forests and on private lands, to be disposed of as soon as possible, since if not marketed quickly it will not be worth cutting at all.

Since the amount to be disposed of from government lands is doubtless greater than can be marketed in any event, and since it is better for the country that the timber should be utilized than that it should go to waste in the woods, the price at which it will be sold will be lower than would be asked for the timber under ordinary circumstances.

If the six billion feet were a total loss, and if its stumpage value were put at the average price at which national forest timber was sold last year, it would be the equivalent of a money loss of about 17 million dollars. It is believed that his year's fires either burned up or killed between 1 and 2 per cent. of the total stand of national forest timber. At the present rate of cutting from the national forests, six billion feet is equal to 12 years' supply; but it is less than one-sixth of a single year's cut in the entire country.

A Motor Trip Through the Alps.

There has been begun and in part already put in operation what seems likely to be one of the most attractive mountain routes in the world, wholly in the French and Maritime Alps, beginning at Evian, on the south shore of lake Geneva about the middle of its length, and extending southward, over and among the mountains, to the Mediterranean at Nice, a distance of 345 miles, passing a little to the east of Mont Blanc, by Albertville and Briançon, which are the eastern termini of railways penetrating the Alps. A large part of this long mountain road has been built heretofore in separate sections. From Evian to Albertville, 87 miles, was operated this year. The vehicles are motor cars, each with seats for 14, which will take four days for the trip, the passengers spending the nights at Albertville, Briançon and Beauzever. This will make an extraordinarily attractive journey for those who leave the Riviera for the north in the spring.

American Association of Railway Surgeons.

The annual meeting of the American Association of Railway Surgeons was held at Chicago last week. The following officers were elected: President, Dr. A. R. Mitchell, Lincoln, Neb., succeeding H. C. Fairbrother, of St. Louis; vice-presidents, Dr. G. W. Gale, Jr., St. Louis; Dr. C. B. Quinn, Macomb, Miss., and Dr. I. K. Gardner, New Hampton, Iowa; treasurer, Dr. H. B. Jennings, Council Bluffs, Iowa; secretary, Dr. Louis T. Mitchell, Chicago. It was decided among other things to appoint a committee to urge improved sanitation along the right-of-way of railways, in cars and in stations. This committee will be expected to co-operate with state boards of health and with municipal authorities. It will consist of five members and will be expected to direct its attention to the abolition of the common drinking cup, to securing the cleaning of filthy stations, to eliminating the dust-raising whisk broom of the Pullman porter, etc. It will also use its influence to induce railways to quit housing laborers in abandoned freight cars along the right-of-way, which practice, it is said, is a breeder of disease. The movement, however, will have particularly in view the protection of the health of passengers. Dr. J. W. Price, oculist of the Rock Island lines at Memphis, Tenn., presented a paper describing experiments conducted by him to ascertain the extent to which locomotive engineers need spectacles. He strongly advocated the use of spectacles by engineers when the slightest defect of the eyes develops. He said that the prevalent use of goggles by automobilists should teach railway men the advantages to be derived from using some form of protection for their eyes. He expressed the opinion that the railway managements are not sufficiently careful to see that the eyes of engineers are as perfect as they should be in the interest of safety.

Canadian Society of Civil Engineers.

At the meeting of the electrical section held on October 27, an address was given by P. W. Sothman, M. Can. Soc. C. E., entitled "Talk on the Hydro-Electric Power Commission's 110,000 Transmission System."

American Railway Association.

The fall meeting of this association will be held at the Planters Hotel, St. Louis, November 16. Reports will be presented by the Committees on Transportation, on Maintenance, on Relations between Railways, on the Safe Transportation of Explosives and Other Dangerous Articles, and on Electrical Working.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.
AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; next meeting June 22, 1911; Niagara Falls, N. Y.
AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn.
AMERICAN ASS'N OF LOCAL FREIGHT AGENTS' ASS'N.—G. W. Dennison, Penn. Co., Toledo, Ohio.
AMERICAN ASS'N OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew Bldg., Cincinnati, Ohio.
AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York.
AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago; Sept. 17-19, 1911; St. Louis, Mo.
AMERICAN RAILWAY ENGINEERING AND MAINT. OF WAY ASS'N.—E. H. Fritch, Monadnock Bldg., Chicago; March 21-23, 1911; Chicago.
AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W Ry., St. Louis, Mo.; May 6, 1911; Detroit, Mich.
AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony Building, Chicago.
AM. RAILWAY TOOL FOREMEN'S ASS'N.—O. T. Harroun, Bloomington, Ill.
AM. SOC. FOR TESTING MATERIALS.—Prof. E. Marburg, Univ. of Penn., Phila.
AM. SOC. OF CIVIL ENGS.—C. W. Hunt, 220 W. 57th St., N. Y.; 1st and 3d Wed., except July and August; annual, Jan. 18-19; New York.
AM. SOCIETY OF ENGINEERING CONTRACTORS.—D. J. Haner, 13 Park Row, New York.
AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 29th St., New York; annual, Dec. 6-9; New York.
AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.
ASSOCIATION OF AM. RY. ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; April 26, 1911; New Orleans, La.
ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; May, 1911; Montreal, Can.
ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS—G. B. Colegrove, I. C. R.R., Chicago.
ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; June 19, 1911; Boston.
ASS'N OF TRANS. AND CAR ACC. OFFICERS.—G. P. Conard, 24 Park Place, N. Y.; Dec. 13-14, Chicago; June 20-21, 1911, Cape May City, N. J.
CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.
CANADIAN SOCIETY OF CIVIL ENGS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays; Montreal; annual, last week January.
CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month; Chicago.
CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.
ENGINEERS' SOCIETY OF PENN.—E. R. Dasher, Box 704, Harrisburg, Pa.
ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton Bldg., Pittsburgh; 1st and 3d Tues.; annual, Jan. 17, 1911; Pittsburgh.
FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich., Fred. & Pot. R.R., Richmond, Va.; 20th annual, June 21, 1911; St. Paul, Minn.
GENERAL SUPERINTENDENTS' ASS'N OF CHICAGO.—H. D. Judson, 209 Adams St., Chicago; Wednesday preceding 3d Thurs.; Chicago.
INDIANAPOLIS RY. AND MECH'L CLUB.—B. S. Downey, C., H. & D., Indianapolis, Ind.
INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; next convention, Omaha, Neb.
INTERNAT'L RY. FUEL ASS'N.—D. B. Sebastian, La Salle St. Station, Chicago: May 15-18; Chattanooga, Tenn.
INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.
INT. RY. MASTER BLACKSMITHS' ASS'N.—A. L. Woodworth, Lima, Ohio.
INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.
IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.
MASTER CAR BUILDERS' ASS'N.—J. W. Taylor, Old Colony Bldg., Chicago.
MASTER CAR AND LOCO. PAINTERS' ASS'N OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass.
NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept.; Boston.
NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.
NORTH-WEST RAILWAY CLUB.—T. W. Flanagan, Soo Line, Minn.; 1st Tues. after 2d Mon., except June, July, August; St. Paul and Minn.
NORTHERN RAILWAY CLUB.—C. L. Kennedy, C., M. & St. P., Duluth; 4th Saturday; annual, Nov. 26; Duluth, Minn.
OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Blk.; Second Wed.
RAILWAY CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City; 3d Friday in month; Kansas City.
RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.
RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.
RAILWAY S'KEEPERS' ASS'N.—J. P. Murphy, Box C, Collinwood, O.; annual, May, 1911.
RICHMOND RAILROAD CLUB.—F. O. Robinson; 2d Monday; Richmond.
ROADMASTERS' AND MAINTENANCE OF WAY ASS'N.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Oct., 1911; St. Louis.
ST. LOUIS RAILMAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.
SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago; Oct. 25 and 26; Hotel Chamberlin, Old Point Comfort, Va.
SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. R. Ry., Montgomery, Ala.
SOUTHERN & SOUTHWESTREN R.R. CLUB.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs.; Jan., Mar., July, Sept. and Nov.; Atlanta.
TOLEDO TRANSPORTATION CLUB.—L. G. Macomber, Woolson Spice Co., Toledo; 1st Sat.; annual, May 6, 1911; Toledo.
TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; 1st Sat. after 1st Wed.; annual, Dec. 13; Buffalo.
TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August; New York.
TRAFFIC CLUB OF PITTSBURGH.—T. S. Walters, Oliver Building, Pittsburgh; meetings monthly; Pittsburgh.
TRAIN DESPATCHERS' ASS'N OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 20, 1911; Baltimore.
TRAVELING ENG'RS' ASS'N.—W. O. Thompson, N. Y. C. & H. R. R. E. Buffalo.
WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg; 2d Monday, except June, July and August; Winnipeg.

Traffic News.

Fourteen organizations of printers and employers of printers at Chicago have sent resolutions to the Interstate Commerce Commission urging an early decision in the freight rate advance cases because the suspension by the commission of the rates proposed by the railways has prevented the publication of the tariffs and thereby thrown many printers out of employment.

The Lehigh Valley, which has a ticket office in the Hudson Terminal at Church and Cortlandt streets, New York City, for the convenience of passengers who cross the river by the Hudson Tunnel, is to have an office also in the Thirty-third street station of the tunnel road. Thirty-third street is the present northern terminus of the tunnels, and the station will be opened November 10.

The railways of Ohio have postponed their proposed increase in freight rates until February 1, 1911. This is a second postponement, the first having been until November 1, pending the investigation by the Interstate Commerce Commission. The Ohio railroad commission rejected the new tariffs when presented last summer. It will await the finding of the federal commission before resuming the inquiry.

The annual report of Wells, Fargo & Co. for the year ended June 30 shows gross earnings of the express department of $27,303,701, compared with $24,476,432 in 1909. Operating expenses increased from $21,213,953 in 1909 to $24,120,227, leaving net revenue from express operations totaling $3,183,474, against $3,262,478 in the previous year. Net revenue from other sources was $1,641,066, against $1,401,900 in 1909. Total net earnings were $4,824,541, as compared with last year's showing of $4,664,379.

An agreement has been reached by representatives of the principal western railways and shippers of vehicles and agricultural implements for a readjustment of rates and minimum weights on these commodities. Under this agreement the railways are to raise the rate from Chicago to points in the southwest from 79 to 85 cents, and, on the other hand, are to reduce substantially the minimum carload weight, the new minimums ranging from 10,000 lbs. for cars 36 ft. 6 in. long to 20,000 lbs. for cars 46 ft. 7 in. long. The minimums have been so high in the past that shippers have complained that they could not load them into cars of ordinary sizes.

The traffic department of the Southern Railway reports that shipments of apples from points on lines of that company in Virginia will this year be at least twice as heavy as last year, when nearly 100,000 barrels were sent out. The farmers in the valley of Virginia expect this year to take in half a million dollars for apples, the best grades bringing about $3 a barrel. Five years ago the crop was not one-fifth that of this year, and ten years ago shipments were only fragmentary. This remarkable growth has resulted from increased intelligence, care, spraying and cultivation. All this is in a territory separate from the Piedmont section, where apples have been the principal crop for many years.

The Pennsylvania has issued passenger tariffs to its new station in New York City from stations in New Jersey within 32 miles. All of the rates—single trip tickets, 50-trip family tickets and season tickets—are higher than those to the ferry terminals in New York City, now in effect, and the monthly ticket rates are $5 higher, which seems to indicate that the company does not wish to encourage the use of the new station by regular suburban passengers—or at least not to the detriment of through business. From Newark, nine miles, the present single ticket rate to the Manhattan termini, including the Hudson tunnel terminal at Church street, is 17 cents; to the new station it will be 27 cents. From New Brunswick, 31 miles, the present rate is 78 cents; to the new station 86 cents. Fifty-trip tickets from Newark are increased from $6 to $11; from New Brunswick, increased from $27 to $32. Monthly tickets from Newark, $6; to the new station, $12; New Brunswick, $12; to the new station, $18.

At a hearing on the application of the Buffalo, Rochester & Eastern which was given by the New York State Public Service Commission last week, C. H. Ewing, of the New York Central,

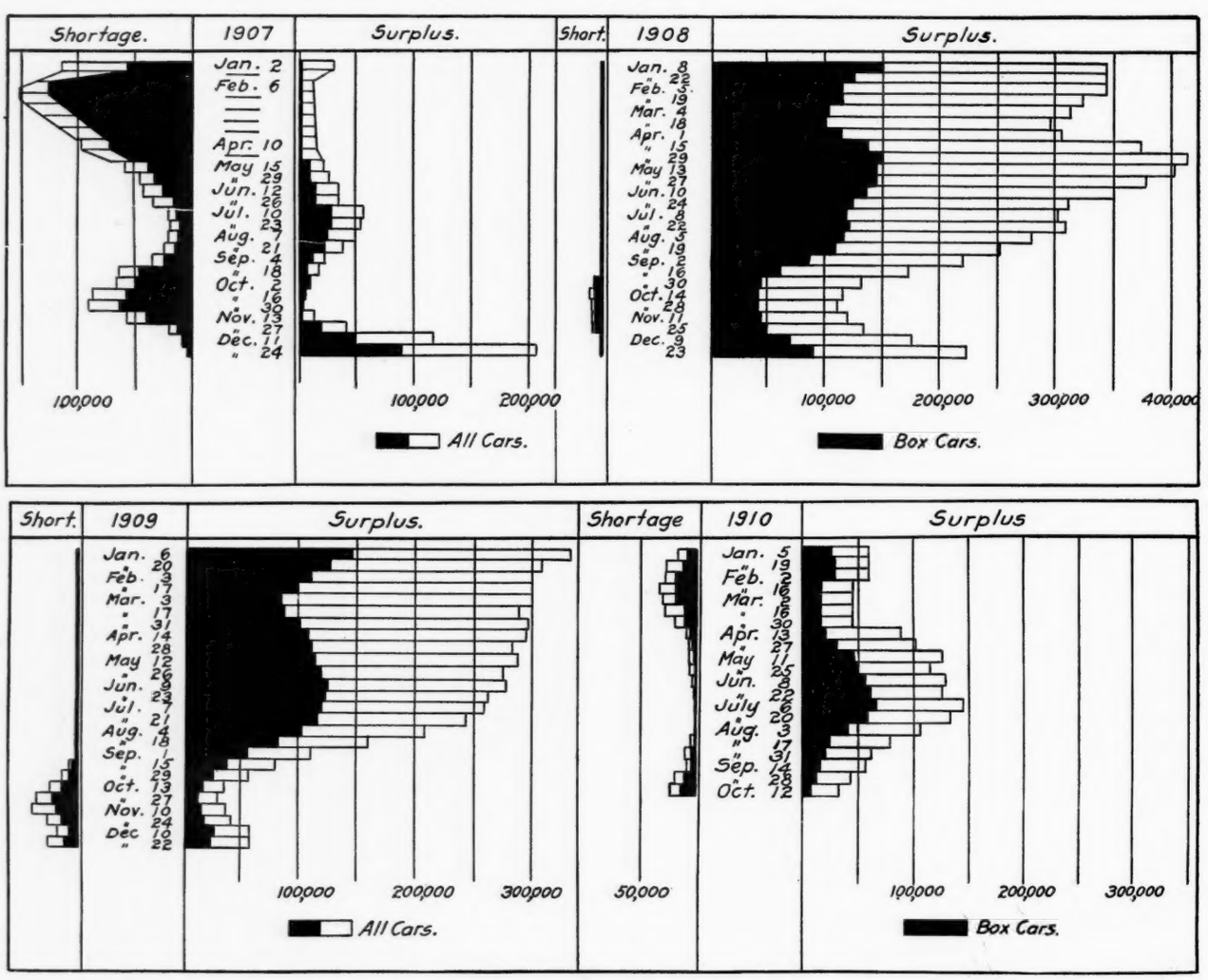
gave elaborate statistics of the movement of freight over that road. Of the refrigerator cars ordered by fruit shippers in western New York in the month of September 95 per cent. were furnished on time, and 99.81 per cent. were furnished on the day wanted or on the next day. The actual time of the special daily fruit trains from that region to the markets averaged, for September, 29 hours 53 minutes to New York on schedules averaging 29 hours 33 minutes. A shipper having complained that it took 10 or 12 days to carry his fruit to New York City, Mr. Ewing produced records to show that only two of the cars sent by the complainant took as long as six days, and these were delayed by storms. The New York Central runs freight cars out of Buffalo in the evening, which arrive at Rochester and Syracuse the next morning, and at Schenectady the second day. As a whole, the fast freight trains of the New York Central arrive at destination a little ahead of time.

P. W. Coyle, commissioner of the Traffic Bureau of the Business Men's League of St. Louis, issued a statement on October 18, calling attention to the fact that the denial by the United States Supreme Court of the motion for rehearing in the Missouri river rate case will cause a complete change in the adjustment of rates from eastern points to points on the Missouri river and to Denver. While the rate between the Mississippi and Missouri rivers on goods moving from Atlantic seaboard points was reduced from 60 to 51 cents (first class) the local rate between the Mississippi and Missouri rivers is left at 60 cents. Mr. Coyle calls attention to the fact that this places St. Louis at a relative disadvantage of 9 cents per 100 lbs., and adds: "We assume that the carriers or the Missouri railroad and warehouse commission will eliminate this high differential by the establishment of the 51-cent rate to apply on all shipments handled between the Mississippi and Missouri rivers. This, it appears to us, must be the logical result of the establishment of the commission's rates." The Interstate Commerce Commission, in its decision in the Missouri river rate case plainly indicated that it did not think the rates between the Mississippi and Missouri rivers should be reduced locally, the principle on which the decision was made being that the through rate, ordinarily, should be less than the sum of the locals. It was pointed out at the time the decision was rendered that the Missouri railway commission could easily upset the Interstate Commerce Commission's adjustment by making the reductions locally which the Interstate Commission said should not be made. Mr. Coyle's statement evidently is the first move in the direction of getting these reductions made. If this move is successful it will simply mean that the relations between the rates will be the same as they were before the Interstate Commerce Commission acted, the only difference being that the railways will get less revenue from the business.

Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 81 giving a summary of car shortages and surpluses by groups from May 26, 1909 to October 12, 1910, says:

"The surplus decreased 8,734 cars, bringing the total down to 33,735. The surplus of box cars decreased 3,288, coal and gondola 1,837 and miscellaneous 2,300 cars. The decrease in the latter item is made up largely of coke cars in groups 2 (Eastern) and 3 (Middle), and stock cars in groups 8 (Middle Western), 9 (Southwestern) and 10 (Pacific). The decrease in box surplus, while quite general, is particularly noticeable in the



Car Surpluses and Shortages in 1907, 1908, 1909 and 1910.

West, the surplus of this class in group 10 (Pacific) having been practically wiped out, with shortages on the increase.

"The total shortage is 20,419 cars, an increase of 2,478. The box car shortage totals 12,153, now being in excess of the reported surpluses. There is also a slight increase in the coal car shortage, which is still chiefly in groups 4 (Middle Atlantic) and 5 (Southern). Group 4 (Middle Atlantic) reports a considerable shortage of box cars, as do also the groups in the western section of the country."

transportation consists of two kinds of tickets not originally issued for a joint trip.

The Nebraska railway commission has extended the date when its order requiring the railways of Nebraska to pay higher switching rates to the South Omaha Stockyards Company shall go into effect from October 24 to November 1. Counsel for the railways contend that the commission has no power to make the roads absorb the higher switching charges, and the commission does not want its order to go into effect until it knows whether

Car Surpluses and Shortages.

Date.	No. of roads.	Surpluses Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—October 12, 1910	8	400	122	129	343	994	627	175	453	25	1,280
" 2.— " 12, 1910	24	1,038	75	1,509	6,291	8,913	366	0	252	114	732
" 3.— " 12, 1910	23	1,869	300	336	1,988	4,493	310	2	633	53	998
" 4.— " 12, 1910	10	18	95	423	270	806	2,374	245	2,037	50	4,706
" 5.— " 12, 1910	17	0	11	185	675	871	1,481	392	1,217	40	3,130
" 6.— " 12, 1910	20	5,040	572	1,571	2,416	9,599	242	0	446	397	1,085
" 7.— " 12, 1910	4	18	76	2	33	129	162	0	144	254	560
" 8.— " 12, 1910	14	31	42	237	1,285	1,595	1,402	51	72	6	1,531
" 9.— " 12, 1910	9	245	173	101	356	875	719	29	103	50	901
" 10.— " 12, 1910	10	156	446	1,511	2,850	4,963	2,153	260	76	400	2,889
" 11.— " 12, 1910	3	41	173	30	253	497	2,317	45	0	245	2,607
Total	151	8,856	2,085	6,034	16,760	33,735	12,153	1,199	5,433	1,634	20,419

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland, and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia, and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota and the Dakotas lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California and Arizona lines; Group 11—Canadian lines.

The accompanying table gives car surpluses and shortages by groups for the latest period covered by the report, and the charts show total surpluses and shortages, bi-weekly, in 1907, 1908, 1909 and 1910.

INTERSTATE COMMERCE COMMISSION.

The Interstate Commerce Commission has issued an order directing that when a tariff is filed by a railway, including both increases and reductions in rates, the reductions may go into effect on one day's notice but the increases will be suspended for the usual time necessary for investigation.

Hearings and Suspensions of Tariffs.

The Interstate Commerce Commission will give a hearing in New York City November 16 on complaints against the commutation ticket rates to New York which last summer were increased by the Pennsylvania and other roads.

The Interstate Commerce Commission on Monday last suspended grain traffics which had been issued by the railways of the Northwest to go into effect November 1. The commission deemed it proper to require the railways to prove the reasonableness of the increases proposed. The suspension is until March 1, and the roads interested are the Chicago & North Western, the Chicago, Milwaukee & St. Paul and the others in that region. Eighty-six participating carriers are named as defendants. A general tariff of the Chicago & North Western between points in Illinois and points in Wisconsin was suspended at the same time, complaint being made of the abolition of important commodity rates.

STATE COMMISSIONS.

The Nevada State Railroad Commission has ordered large reductions in the freight rates on lumber to go into effect November 20. An example is the rate from Goldfield to Verdi, where the reduction is from $13 a ton to $8 on the higher grades of lumber and to $5 on the lower grades.

The State Railroad Commission of Pennsylvania has notified all the railways of the state that the rule about through checking of baggage which has recently been adopted by the Pennsylvania is to be prescribed by the commission for observance by all railways of the state. This rule is to the effect that a passenger holding transportation through to a point on another road may have his baggage checked through, even though his the higher charges will have to be paid by the trunk line railways or the shippers.

The New York State Public Service Commission, Second district, has authorized all steam roads to suspend until February 1, 1911, tariffs containing general increases in freight rates which would otherwise go into effect November 1. The commission previously made an order authorizing the postponement of these increases from August 1 to November 1. This action in New York state follows action in interstate business taken by the Interstate Commerce Commission, pending investigation of general rate advances by that commission.

The Indiana railway commission has ordered H. F. Houghton, general superintendent of the Big Four, to supply it with data regarding the ages and service records of telegraph operators employed by that road, and Mr. Houghton has informed the commission that, on the advice of counsel, he will not furnish the information. The commission has indicated that it will try to get the Marion county court to compel Mr. Houghton to supply the information. The order of the commission was issued in connection with its investgation of a wreck at Brightwood, Ind. Mr. Houghton furnished the desired information regarding the telegraph operators who were in any way concerned with the Brightwood accident, but refused to give information about other operators. It is charged by the commission that the Big Four and other railways are employing men as telegraph operators who are too young and inexperienced.

Railway Building in British India.

An effort is being made by the business men of Karachi to secure the sanction of the Indian government to the extension of the meter gage railway from Hyberabad to Karachi. This railway now extends from Hyderabad, Sind, to Jodhpur, Rajputana, but through freight from Rajputana to Karachi does not use this line to any great extent on account of the necessary transfer at Hyderabad to the broad gage, and the high charges of the broad-gage road for the short haul from Hyderabad to Karachi. It is believed that much larger trade will result between Rajputana and Karachi if this extension is allowed, and it would furnish Karachi with an additional line of communication with the interior, this being necessary on account of frequent damage to railway lines because of floods which occur during the wheat seasons. Communications have already been interrupted for three days during the present season, while three or four years ago all freight traffic with the interior was cut off for a period of 34 days.

REVENUES AND EXPENSES OF RAILWAYS.

(See also issues of October 7, 14, and 21.)

MONTH OF AUGUST, 1910.

Name of road.	Mileage operated; end of period.	Operating revenues			Operating expenses						Net operating revenues (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with last year.
		Freight.	Passenger.	Total, inc. misc.	Maintenance: Way and structures.	Maintenance: Of equipment.	Traffic.	Transportation.	General.	Total.					
Arizona Eastern	347*	$91,350	$31,624	$132,028	$23,835	$11,983	$2,358	$42,025	$6,670	$86,871	$45,157	.....	$4,719	$40,438	—$8,245
Atlantic City	166	71,709	246,140	330,790	20,452	10,148	5,876	121,848	1,221	159,545	171,245	—$2,932	7,000	161,268	17,970
Baltimore & Ohio System	4,439	6,480,427	1,613,423	8,550,059	1,164,990	1,440,167	200,598	2,772,370	155,886	5,734,011	2,816,048	15,927	215,407	2,616,568	94,084
Carolina, Clinchfield & Ohio	236	103,795	20,248	129,328	10,763	18,868	6,092	27,082	8,214	71,019	58,309	.....	5,500	52,809	25,651
Charleston & Western Carolina	340	90,848	35,578	132,940	30,192	16,291	3,647	41,684	3,650	95,464	37,476	.....	4,475	33,001	18,996
Chesapeake & Ohio of Indiana	285†	107,730	37,643	151,511	25,954	19,752	6,623	61,987	4,486	118,802	32,709	.....	3,790	28,919	.....
Chicago & Alton	998	915,877	457,836	1,460,644	173,914	193,862	38,328	462,559	33,130	901,793	558,851	—1,792	37,300	519,759	—46,632
Chicago, Peoria & St. Louis	255	120,542	35,428	164,245	25,889	31,810	6,954	60,488	5,129	130,270	33,975	.....	4,500	29,475	—5,982
Colorado & Southern	1,248	599,659	209,810	847,717	137,157	169,090	13,352	257,709	22,115	599,423	248,294	831	24,700	224,425	—12,886
Denver, Northwestern & Pacific	215	55,328	66,264	127,521	13,610	12,935	3,391	31,980	3,142	65,058	62,463	.....	3,000	59,463	—286
Detroit, Grand Haven & Milwaukee	190	83,804	62,748	168,663	28,764	21,056	6,105	81,420	4,432	141,777	26,886	39	3,009	23,916	—21,624
Georgia Southern & Florida	395	98,697	69,027	191,791	21,384	41,329	6,448	71,061	8,483	148,705	43,086	.....	9,664	33,422	—3,592
Grand Trunk Western	347	226,626	188,999	452,973	58,960	86,114	16,089	196,399	10,231	367,793	85,180	—934	31,698	52,548	—113,948
Gulf & Ship Island	307	115,805	38,678	163,634	20,140	28,627	1,809	45,971	7,496	104,043	59,591	.....	5,191	54,400	19,832
Illinois Central	4,550	3,374,382	1,233,994	5,188,621	785,481	1,146,861	108,341	1,668,148	99,110	3,807,941	1,380,680	—7,954	198,000	1,174,726	338,535
International & Great Northern	1,159	490,057	173,499	714,955	114,091	103,829	20,135	273,949	20,744	532,748	182,207	—400	20,000	161,807	82,509
Iowa Central	559	228,423	59,719	302,173	44,862	54,800	7,540	103,680	9,166	220,048	82,125	.....	9,753	72,372	9,298
Kanawha & Michigan	175	271,850	33,995	311,725	34,541	48,811	2,310	75,026	6,314	167,002	144,723	.....	7,950	136,773	56,219
Louisiana & Arkansas	255	108,232	17,272	130,140	19,263	17,178	2,503	21,433	4,344	74,721	55,419	.....	2,500	52,919	25,545
Louisiana Ry. & Nav. Co.	350	103,837	20,321	139,234	24,691	17,094	4,686	51,956	5,335	103,762	35,472	.....	4,400	31,072	9,980
Minneapolis & St. Louis	1,027	270,220	133,519	433,300	54,262	49,331	11,752	167,975	12,766	296,086	137,214	—132	19,438	117,644	—4,082
Minn., St. Paul & S. S. Marie System	3,573‡	1,333,558	489,058	1,948,151	199,752	254,360	38,904	656,187	38,263	1,187,466	760,685	21,826	115,270	667,241	—89,753
Nashville, Chattanooga & St. Louis	1,230	627,438	271,123	953,548	148,497	171,688	39,762	343,847	24,861	728,655	224,893	—1,470	22,287	201,136	—22,953
Northwestern Pacific	376	156,870	184,965	364,138	53,802	42,597	2,840	109,884	8,965	218,088	146,050	.....	10,500	135,550	25,516
Oregon & Washington	244§	72,734	77,005	157,821	12,191	6,089	11,592	64,288	4,074	98,234	59,587	—1,623	3,300	54,664	55,052
Pittsburgh, Shawmut & Northern	240	108,020	11,929	121,852	28,204	31,167	1,257	40,006	4,524	105,158	16,694	.....	1,599	15,095	—2,192
St. Joseph & Grand Island	319	102,952	49,517	164,805	39,913	20,570	7,089	66,271	5,766	139,609	25,196	82	5,389	19,889	—13,852
St. Louis & San Francisco	4,731	2,214,100	1,046,018	3,481,132	459,563	477,874	67,724	1,174,560	90,715	2,270,436	1,210,696	.....	137,585	1,073,111	80,721
St. Louis, Brownsville & Mexico	494‖	89,899	44,147	147,578	39,345	15,762	2,026	47,038	7,524	111,695	35,883	.....	4,000	31,883	16,853
Seaboard Air Line	3,028¶	977,411	403,363	1,544,978	244,315	227,937	62,165	530,739	43,340	1,108,496	436,482	—1,728	65,000	369,754	17,111
Southern Indiana	237	147,400	20,161	169,636	20,929	40,977	1,504	49,185	4,987	117,582	52,054	—376	6,928	44,750	—4,617
Spokane, Portland & Seattle	429	333,317	94,904	449,913	49,198	26,348	3,405	106,944	7,805	193,700	256,213	781	21,800	235,194	104,587
Toledo, St. Louis & Western	451	286,019	58,907	364,744	54,222	47,330	8,089	111,135	9,957	230,733	134,011	.....	13,900	120,111	—9,980
Trinity & Brazos Valley	458	82,728	34,884	123,800	35,515	30,601	7,941	74,086	8,447	156,590	—32,790	.....	3,500	—36,290	—17,644
Western Maryland	543	540,981	132,312	702,582	101,163	69,867	12,238	207,399	12,437	403,104	299,478	—149	19,500	279,829	.....
Yazoo & Mississippi Valley	1,372	469,690	204,751	719,540	207,267	162,434	14,402	244,812	20,879	649,794	69,746	—1,518	33,000	35,228	37,095
TWO MONTHS OF FISCAL YEAR, 1911.															
Arizona Eastern	347*	$194,990	$64,633	$277,599	$51,367	$23,921	$4,105	$79,881	$10,005	$169,279	$108,320	.....	$9,437	$98,883	$6,954
Atlantic City	166	143,153	471,102	636,501	42,012	22,062	8,900	241,209	4,005	318,188	318,313	—$14,747	14,000	289,566	36,978
Baltimore & Ohio System	4,439	12,149,303	3,069,204	16,097,792	2,283,773	2,785,339	402,360	5,370,615	315,814	11,157,901	4,939,891	4,121	424,978	4,519,034	—52,169
Carolina, Clinchfield & Ohio	236	185,937	37,204	233,142	20,763	41,796	11,104	51,376	16,538	141,577	91,565	.....	11,000	80,565	44,293
Charleston & Western Carolina	340	169,075	66,448	247,703	52,643	48,381	7,020	78,943	7,324	194,311	53,392	.....	8,950	44,442	17,896
Chesapeake & Ohio of Indiana	285†	195,875	70,762	279,901	47,777	39,151	16,438	120,796	8,881	233,043	46,858	.....	7,580	39,278	.....
Chicago & Alton	998	1,623,953	832,056	2,631,635	310,823	381,398	76,396	872,060	67,225	1,707,902	923,733	—6,600	74,600	842,533	—88,141
Chicago, Peoria & St. Louis	255	217,496	63,466	295,207	50,816	60,635	13,637	116,100	10,763	251,951	43,256	.....	9,000	34,256	—22,666
Colorado & Southern	1,248	1,156,001	402,583	1,637,755	273,483	323,002	27,080	514,774	43,757	1,182,096	455,659	—1,367	49,400	404,892	—27,770
Denver, Northwestern & Pacific	215	98,018	130,903	238,721	30,437	27,710	7,450	60,167	7,727	133,491	105,230	.....	6,000	99,230	—5,780
Detroit, Grand Haven & Milwaukee	190	125,007	120,447	290,149	44,915	36,696	12,941	155,834	8,570	258,956	31,193	70	6,018	25,245	—52,797
Georgia Southern & Florida	395	201,808	134,400	383,782	41,574	81,756	12,446	147,902	17,094	300,772	83,010	.....	17,997	65,013	—5,568
Grand Trunk Western	347	416,821	385,147	873,490	93,576	157,715	36,045	372,203	22,247	681,786	191,704	—1,443	63,395	126,866	—157,837
Gulf & Ship Island	307	221,080	74,869	315,360	40,119	54,323	4,134	92,391	16,063	207,030	108,330	.....	10,265	98,065	29,185
Illinois Central	4,550	6,337,750	2,327,979	9,866,063	1,547,467	2,159,618	228,907	3,205,170	201,007	7,342,169	2,523,894	—14,086	396,000	2,113,808	899,201
International & Great Northern	1,159	956,237	348,693	1,407,334	265,943	215,337	38,783	555,903	42,378	1,118,344	288,990	—400	40,000	248,590	165,636
Iowa Central	559	408,468	109,757	545,063	81,020	103,142	14,849	210,400	17,790	427,201	117,862	.....	19,532	98,330	4,093
Kanawha & Michigan	175	500,720	65,395	577,921	75,040	96,084	6,247	150,957	12,449	340,777	237,144	—9	15,594	221,541	67,882
Louisiana & Arkansas	255	201,214	33,090	243,517	39,810	32,623	4,975	60,141	8,554	146,103	97,414	.....	5,100	92,314	26,738
Louisiana Ry. & Nav. Co.	350	194,536	41,884	262,204	49,546	31,288	9,473	105,229	11,977	207,513	54,691	.....	8,800	45,891	14,258
Minneapolis & St. Louis	1,027	535,457	251,802	846,869	101,598	99,039	23,436	323,504	27,707	575,284	271,585	—65	38,900	232,620	—10,984
Minn., St. Paul & S. S. Marie System	3,573‡	2,667,599	1,016,229	3,938,086	430,268	488,685	77,982	1,294,940	76,034	2,367,909	1,570,177	43,290	233,322	1,380,145	—38,389
Nashville, Chattanooga & St. Louis	1,230	1,256,048	518,283	1,883,212	275,975	348,433	73,512	690,032	50,066	1,438,018	445,194	—1,397	44,574	399,223	—25,780
Northwestern Pacific	376	279,976	420,955	745,576	96,996	78,980	6,109	214,994	18,030	415,109	330,467	.....	21,000	309,467	51,399
Oregon & Washington	244§	147,148	157,502	320,860	28,280	10,208	20,642	123,392	7,820	190,342	130,518	—1,807	6,600	122,110	121,670
Pittsburgh, Shawmut & Northern	240	204,344	21,956	229,490	52,757	58,625	2,251	77,035	9,660	200,328	29,162	.....	3,177	25,985	—7,950
St. Joseph & Grand Island	319	190,452	91,391	305,310	72,769	39,473	13,133	129,915	11,393	266,683	38,627	101	10,777	27,951	—43,526
St. Louis & San Francisco	4,731	4,230,581	2,008,882	6,676,868	919,980	919,884	151,483	2,330,921	190,758	4,513,026	2,163,842	.....	250,170	1,913,672	8 040
St. Louis, Brownsville & Mexico	494‖	162,754	87,433	273,896	77,530	30,817	4,154	101,751	15,222	229,474	44,422	.....	8,000	36,422	6,718
Seaboard Air Line	3,028¶	1,949,524	769,467	3,047,224	480,263	457,333	119,001	1,069,954	88,215	2,214,767	832,457	—4,641	130,000	697,816	10,546
Southern Indiana	237	275,912	38,816	318,500	40,000	72,114	3,274	92,030	10,689	218,107	100,393	—520	13,857	86,016	462
Spokane, Portland & Seattle	429	597,148	180,803	812,972	103,444	48,402	6,820	224,478	15,083	398,227	414,745	1,454	43,600	372,599	98,965
Toledo, St. Louis & Western	451	513,608	99,401	653,086	81,656	78,673	16,683	215,964	19,049	412,025	241,061	.....	27,800	213,261	—16,152
Trinity & Brazos Valley	458	154,995	69,124	233,166	66,596	65,137	15,343	142,863	17,907	307,846	—74,680	.....	7,000	—81,680	—31,091
Western Maryland	543	1,023,684	257,361	1,337,698	179,622	135,847	24,556	405,414	24,867	770,307	567,391	247	39,000	528,638	.....
Yazoo & Mississippi Valley	1,372	906,081	392,453	1,390,565	384,506	290,047	28,294	486,881	43,526	1,233,254	157,311	—2,078	66,000	89,233	150,713

Mileage operated on August 31, 1909: * 299 miles; ‡ 3,425 miles; § 6 miles; ‖ 455 miles; ¶ 2,987 miles. † Succeeded Chicago, Cincinnati & Louisville on July 1, 1910. —Indicates Deficits, Losses and Decreases.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

Charles H. Hempstead, transfer clerk of the New York, New Haven & Hartford, has been appointed assistant secretary, with office at New Haven, Conn., succeeding Arthur E. Clark, promoted.

Richard H. Aishton, general manager of the Chicago & North Western at Chicago, has been elected vice-president in charge of maintenance and operation, with office at Chicago, succeeding W. A. Gardner. Mr. Aishton was born at Evanston, Ill., in June, 1860. He was educated in the public schools at Evanston and began railway work in 1878 as an axman with an engineering corps on the Chicago & North Western. He remained in the engineering department until 1895, being promoted consecutively to rodman, division engineer, roadmaster and superintendent of bridges and buildings. He was then transferred to the operating department, first as trainmaster, and was later promoted to assistant superintendent, superintendent and general superintendent. He was appointed assistant general manager in 1902, and four years later was made general manager. Mr. Aishton is chairman of the General Managers' Association of Chicago.

R. H. Aishton.

F. B. Sheldon, assistant to the president and chief engineer of the Hocking Valley at Columbus, Ohio, has been elected president of the Kanawha & Michigan, with office at Columbus, succeeding Nicholas Monsarrat, deceased.

Maxwell Evarts, general attorney of the Union Pacific at New York, has been appointed general counsel of the Union Pacific, the Southern Pacific, the Oregon Short Line and the Oregon Railroad & Navigation Co., with office at New York.

J. T. Harahan, president of the Illinois Central, stated recently that he expects to retire under the pension system of the road on or before January 12, 1911. It is understood that the place of chairman of the board will be created and that Mr. Harahan will be appointed to it.

W. J. Souder, auditor and purchasing agent of the St. Paul & Des Moines, with office at Des Moines, Ia., has resigned to engage in other business. T. S. Ford has been appointed to succeed Mr. Souder, and will have the title of assistant auditor until the next meeting of the board of directors.

Richard A. Jackson, general counsel of the Great Northern at St. Paul, Minn., has been elected vice-president in charge of legal affairs, with office at St. Paul. Mr. Jackson was president of the Rock Island Company from April, 1909, to January, 1910. His photograph and a sketch of his life were published in the *Railway Age Gazette* of June 18, 1909.

Marvin Hughitt, president of the Chicago & North Western, has retired to become chairman of the board of directors. W. A. Gardner, vice-president in charge of maintenance and operation, has been elected president, succeeding Mr. Hughitt. (See sketches of Mr. Hughitt and Mr. Gardner published elsewhere in this issue.) Samuel A. Lynde, general attorney at Chicago, has been elected vice-president in charge of legal and financial departments, succeeding E. E. Osborn, retired on account of ill health. Richard H. Aishton, general manager at Chicago, succeeds W. A. Gardner.

Samuel A. Lynde, general attorney of the Chicago & North Western at Chicago, has been elected vice-president, in charge of legal and financial matters, of the North Western and the Chicago, St. Paul, Minneapolis & Omaha, with office in New York City, succeeding E. E. Osborn, retired on account of ill health. Mr. Lynde was born December 14, 1855, at Rock Island, Ill., and graduated from Harvard College in 1877. He read law in Chicago, and was admitted to the bar in 1882. Since 1881 he has had more or less to do with railway legal work, having been connected at different times with the following roads: Chicago & Western Indiana, Grank Trunk and Chicago & Eastern Illinois. He was appointed general attorney of the Chicago & North Western in 1901, which position he held continuously until his recent election.

Operating Officers.

W. E. Shipp has been appointed an assistant superintendent of the Houston & Texas Central, with office at Ennis, Tex.

I. H. Dillie, a chief despatcher of the Missouri Pacific, has been appointed a trainmaster, with office at Atchison, Kan., succeeding W. H. Broughton, resigned.

J. E. Hood, trainmaster of the Chicago, Milwaukee & Puget Sound, at Alberton, Mont., has been appointed superintendent of the Rocky Mountain division, with office at Three Forks, succeeding F. M. Melin, resigned.

John A. McGrew, inspector maintenance of way of the Delaware & Hudson at Albany, N. Y., has been appointed superintendent of the Saratoga and Champlain divisions, with office at Albany, succeeding A. T. Benjamin, resigned.

G. W. Lillie has been appointed an assistant superintendent of the Oregon Short Line, with office at Pocatello, Idaho, succeeding C. M. Hoffman, resigned. He will have charge of mechanical matters and have supervision over the Pocatello shops and roundhouse.

William D. Cantillon, assistant general manager of the Chicago & North Western at Chicago, has been appointed general manager, with office at Chicago, succeeding Richard H. Aishton, elected vice-president, and W. E. Morse, general superintendent at Chicago, succeeds Mr. Cantillon. Samuel G. Strickland, assistant general superintendent at Chicago, has been appointed general superintendent of the lines east of the Missouri river, excepting the Minnesota and South Dakota divisions, with office at Chicago; and Chester T. Dike, engineer and superintendent of construction at Pierre, S. Dak., has been appointed general superintendent of the Minnesota and South Dakota divisions.

William David Cantillon, assistant general manager of the Chicago & North Western at Chicago, who has been appointed general manager, with office at Chicago, succeeding R. H. Aishton, elected vice-president, was born August 5, 1861, at Janesville, Wis. He received a common school education and began railway work as a freight brakeman on the Chicago & North Western in 1875, and he was promoted in the operating department as follows: To conductor, trainmaster, assistant superintendent, superintendent and assistant general superintendent. He was appointed general superintendent, with office at Chicago, in July, 1902, and in January, 1906, was appointed assistant general manager of the lines east of the Missouri river, which title he held until his recent promotion to general manager.

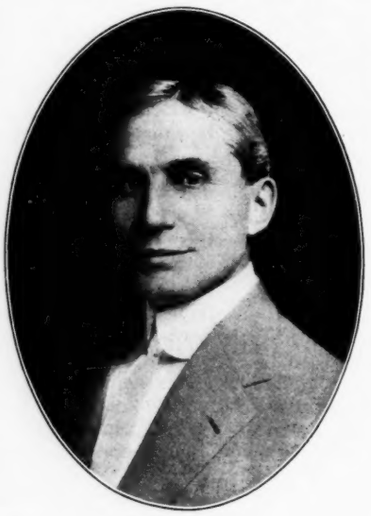
W. D. Cantillon.

Albert Ewing, trainmaster of the Atchison, Topeka & Santa Fe at San Marcial, N. M., has been appointed trainmaster of the Missouri division, with office at Marceline, Mo., succeeding F. E. Summers, promoted. F. J. Mackie succeeds Mr. Ewing

on the Rio Grande division. H. E. Fell has been appointed an assistant trainmaster on the Colorado division.

Samuel George Strickland, who has been appointed general superintendent of the Chicago & North Western, with office at Chicago, was born August 15, 1859. He received his education at collegiate institute and grammar schools at Port Hope and Peterboro, Ont., and began railway work in 1877 as a telegraph operator on the Canadian Pacific. In 1878 he went to the St. Paul, Minneapolis & Manitoba, now the Great Northern, as a telegraph operator. The next year he went to the Chicago, St. Paul, Minneapolis & Omaha as telegraph operator, and he was then successively promoted to agent, general agent, chief clerk to general superintendent, superintendent of terminals, trainmaster, superintendent and general superintendent. He was appointed assistant general superintendent of the Chicago & North Western in 1908, from which position he has now been promoted to general superintendent, succeeding W. E. Morse.

Willis E. Morse, general superintendent of the Chicago & North Western at Chicago, has been appointed assistant general manager, with office at Chicago, succeeding William D. Cantillon, promoted. Mr. Morse was born September 27, 1864, at Belvidere, Ill. He received a high school education and spent a year at Wayland University. In December, 1881, he began railway work with the Chicago & North Western as a telegraph operator, and during the three years following held various positions in station service. He was then made train despatcher, was appointed a trainmaster in 1889, and four years later he became assistant superintendent. For four years from 1897 he was superintendent of several different districts, becoming general superintendent of the lines east of the Missouri river in January, 1906, from which position he is now promoted to assistant general manager.



W. E. Morse.

C. H. Ewing, who was recently appointed superintendent of the Atlantic City Railroad, with office at Camden, N. J., as previously announced in these columns, was born May 28, 1866, in Chester county, Pa., and began railway work August 1, 1883, as a rodman on the Philadelphia & Reading, since which time he has been consecutively to March 1, 1890, transitman and assistant engineer. He was appointed assistant supervisor in March, 1890, and was made a supervisor in September of the following year. In October, 1892, he was appointed division engineer, and in August of the following year he was appointed chief engineer of the Central New England Railway, Poughkeepsie Bridge Route, remaining in that position until August, 1902, when he was appointed division engineer of the Philadelphia & Reading. In May, 1905, he was appointed engineer maintenance of way of the same road, which position he held at the time of his recent appointment as superintendent of the Atlantic City Railroad.

Traffic Officers.

Charles R. Dassell has been appointed a traveling freight agent of the Central of Georgia, with office at Cincinnati, Ohio.

J. A. Stafford has been appointed traffic manager of the Fort Worth Belt Railway at Fort Worth, Tex., succeeding J. W. Carter, assigned to other duties.

W. S. Blair, soliciting freight agent of the Kansas City Southern at St. Louis, Mo., has been appointed assistant general agent, with office at Dallas, Tex.

T. F. Scruby, agent of the Missouri Pacific at Winfield, Kan., has been appointed traveling freight agent, with office at Wichita, Kan., succeeding W. F. Bellairs, promoted.

George F. Thomas, assistant general freight agent of the Chicago Great Western at St. Paul, Minn., has resigned to become secretary and treasurer of the Moore Patent Car Co.

H. M. Brooks has been appointed a commercial agent of the Cincinnati, Hamilton & Dayton, with office at Birmingham, Ala., succeeding V. E. Whitaker, resigned to accept service elsewhere.

V. E. Whitaker, commercial agent of the Cincinnati, Hamilton & Dayton at Birmingham, Ala., has been appointed general agent of the Atlanta, Birmingham & Atlantic, with office at Birmingham.

E. D. Staggs, recently appointed assistant claim agent of the Trinity & Brazos Valley at Teague, Tex., has been appointed assistant claim agent of the Denver & Rio Grande, with office at Denver, Colo.

W. P. Lindsay, district passenger agent of the Missouri, Kansas & Texas at St. Paul, Minn., has been appointed district passenger agent, with office at Pittsburgh, Pa., in charge of the new passenger agency established there.

H. E. Lounsbury, general agent in the freight department of the Southern Pacific at Portland, Ore., has been appointed an assistant general freight agent of the Southern Pacific and the Oregon Railroad & Navigation Company, with office at Portland. J. H. Mulchay succeeds Mr. Lounsbury.

J. H. Harper has been appointed a general agent of the Kansas City, Mexico & Orient, with office at St. Louis, Mo., a new office. H. B. Furlong has been appointed a traveling freight agent, with office in New York City, and W. T. Dunne is appointed a traveling freight agent, with office at Chicago. R. G. Taylor has been appointed a contracting freight agent at Chicago.

H. B. Rox, agent of the Union Line, Pennsylvania Lines West, at Ironton, Ohio, has been appointed agent at Birmingham, Ala., and George W. Koonce succeeds Mr. Rox. John T. Wray, traveling freight agent of the Pennsylvania Lines at Louisville, Ky., has been appointed agent of the Union Line at Atlanta, Ga., and George H. Fyler is appointed agent at New Orleans, La. George Crank has been appointed traveling freight solicitor, with office at San Antonio, Tex. These appointments are effective November 1.

William P. Garside, traveling freight and passenger agent of the Atchison, Topeka & Santa Fe at El Paso, Tex., has been appointed traveling freight and passenger agent, with office at Mexico City, Mex. G. H. Donart succeeds Mr. Garside, J. C. Batham has been appointed a traveling passenger agent, with office at Des Moines, Iowa. A. A. Betts, soliciting freight agent of the Santa Fe, Prescott & Phoenix, has been appointed a traveling freight and passenger agent of that road, and H. B. Kohl has been appointed a traveling passenger agent, with office at Prescott, Ariz.

Engineering and Rolling Stock Officers.

W. S. Boyce has been appointed a roadmaster on the Middle division of the Atchison, Topeka & Santa Fe, with office at Newton, Kan.

M. O'Laughlin has been appointed a roadmaster of the Rock Island Lines, with office at Little Rock, Ark., succeeding Pat Daily, resigned. He will have charge of the territory from Haskell, Ark., to Eldorado (sub-division 53), and from Tinsman to Crossett (sub-division 53A).

C. M. Hoffman, assistant superintendent of the Oregon Short Line and the Southern Pacific Lines east of Sparks at Pocatello, Idaho, in charge of mechanical matters, has been appointed superintendent of motive power of the St. Louis, Brownsville & Mexico, with office at Kingsville, Tex., succeeding John Nicholson, resigned.

OBITUARY.

Gen. Thomas T. Eckert, who was vice-president of the Western Union Telegraph Company from 1881 to 1892 and was president from the last named date until 1902, died at his summer home in Long Branch, N. J., October 20, at the age of 85. General Eckert was born in Ohio and was engaged in telegraph line construction as far back as 1852. He held important places in the military telegraph service during the War of the Rebellion.

Railway Construction.

New Incorporations, Surveys, Etc.

Atchison, Topeka & Santa Fe.—Trains are now operating over the new cut-off from Fullerton, Cal., east via Placentia to Richfield.

Baltimore & Ohio.—The report of this company for the year ended June 30, 1910, shows that much of the work previously undertaken was completed during the year, and work on the uncompleted improvements has been vigorously prosecuted. The more important work carried out during the year included the new double-track bridge over the Susquehanna river; the viaduct known as bridge 68, at Cumberland, Md., which was widened and reinforced to carry heavier rolling stock, and a connection, including a bridge over the Monongahela river, was constructed between Haywood, W. Va., on the Monogah division, and Lumberport, on the Ohio river division. The new double-track drawbridge over the ship canal at Indiana Harbor, Ind., has also been completed, and a number of new passenger stations at various places were put up during the year. The work now under construction, most of which it is expected will be finished during the present fiscal year, includes a change of line and grade reduction, Concord, Del., to Wilmington, 1.1 miles, including a stone viaduct, to replace the steel bridge over Brandywine creek; additional third-track, Sir John's Run, W. Va., to Great Cacapon, about five miles. When this work is finished there will be a continuous third-track from Hodgesville to Orleans Road, about 34 miles; construction of 1.5 miles of siding near Bond, Md.; extension of third-track from Swanton, Md., eastward 2.5 miles; revision of line and change of grade between Hutton, Md., and Corinth, W. Va.; extension of third-track from west of Terra Alta, W. Va., to Rodemer, about four miles, including elimination of tunnels at McGuires and Rodemer. This work will complete the third-track from Rowellsburg to Terra Alta. A change of line and reduction of grade is being made between Blaser, W. Va., and West End, about four miles, including construction of new double-track tunnel about 4,250 ft. long between Tunnelton and West End. The existing Kingwood tunnel, operated in conjunction with this line, will give three tracks and afford necessary relief where the traffic heretofore has been restricted by the single-track gauntlet through Kingwood tunnel. Work is under way on the construction of third-track from West End to Hardman, six miles, including an open cut for three tracks, in place of Murray's tunnel; extension of third-track between Foley, Pa., and Mance, and Sand Patch and Keystone, about five miles; extension of second-track and additional passing sidings between Rockwood, Pa., and Somerset; extension of Quemahoning branch from Jenner, Pa., to a connection with the Somerset & Cambria branch at Somerset, nine miles; construction of second-track in open cut, including elimination of single-track gauntlet, 1,500 ft. through tunnel at Bakerstown, Pa., thereby making second-track continuous from Sand Patch tunnel to Hamler, Ohio, on the Chicago division; extension of second-tracks with grade revisions, additional passing sidings and yard tracks between Wheeling, W. Va., and Lorain, Ohio, and the construction of 21 miles of second-track between Wellsboro, Ind., and McCools, on the Chicago division. With the completion of this work there will remain only 86 miles of single track on the Chicago division. Additions and extensions of yard and terminal facilities are being carried out at various places. The renewal and strengthening of bridges to carry heavier rolling stock and the elimination of grade crossings is also being carried out. The bridges on the line from Philadelphia to Grafton and on the Pittsburgh and Chicago divisions will be completed during 1910, and the rest of the work as early as possible. Grade crossings are being eliminated in the cities of Baltimore, Md., Columbus, Ohio, and Chicago. The work at Baltimore and at Chicago will extend over a period of years; at Columbus it is expected that the work will be finished during the following fiscal year. See report of this company elsewhere in these columns.

Birmingham & Northwestern.—An officer writes that the prospects of building this line are good, and that contracts will be let about January 1, 1911. The plans call for a line from Dyersburg, Tenn., southeast via Friendship, Stokes, Alamo, Bells, Fruitvale or Gadsden and other towns in Madison county, to Jackson, about 45 miles. The work will include a 1,200-ft. trestle. The line will carry coal, timber, grain, cotton and products, as well as live stock. R. M. Hall, president, Dyersburg.

British Columbia & Alaska.—This company, which was organized to build from Vancouver, B. C., north via Lytton, along the Fraser river to Fort George, thence following the Stewart river to Port Conley, and along the valley of the Skeena river, the Stickeen and Teslin, to Dawson, will apply for incorporation to the Canadian parliament at its next session. J. Wolkenstein, president, Seattle. (Aug. 5, p. 262.)

British Columbia Southern.—This company will apply to the parliament of Canada for an extension of time to build lines as follows: From a point near Michel, B. C., to Kananaskis, Alb.; from the Elk river and the Upper Kootenay river to the 49th parallel and the Tobacco Plains; from a point on the Lower Kootenay river to New Westminster, B. C., and Burrard Inlet, with a branch to Nelson, via Salmon river; from Michel creek to Martin creek; from a point on the main line about 36 miles west of the eastern boundary of British Columbia, southerly and easterly, not exceeding 10 miles, and such branch lines from its main line and from the line between Fort Steele and Golden as may be authorized.

Canadian Pacific.—This company will apply to the parliament of Canada at its next session for an extension of time to build the following lines: Lanigan, Sask., to Prince Albert; Wilkie, northerly and westerly towards the Battle river, thence southerly to a connection with the La Combe branch of the Calgary & Edmonton Railway; from Outlook to a junction with the La Combe branch of the Calgary & Edmonton; from Estevan, northwesterly to Forward, on the Weyburn branch; from a point in Township 6, 7, 8 or 9, Range 30, W., westerly to Lethbridge, Alb.; from a point north of Teulon, Man., to a point between Marsh Point and the north boundary of Township 25, Man.

Chicago, Burlington & Quincy.—An officer writes regarding the reports that an extension is to be built from Mexico, Mo., west to Kansas City, that at the present time the company has no serious intention of building the extension.

Chicago, Milwaukee & Puget Sound.—An officer writes that contracts have been let to H. C. Henry, White building, Seattle, Wash., for building the Idaho & Western, from Dishman, Wash., east via Liberty Lake Junction and Post Falls to Coeur d'Alene, about 35 miles. Maximum grades will be 0.5 per cent. and maximum curvature six degrees. There will be a steel bridge over the Spokane river, and docks at Coeur d'Alene.

Chicago, Rock Island & Pacific.—The report of this company for the year ended June 30, 1910, shows that the line between Amarillo, Tex., and Tucumcari, N. Mex., where it joins the main line to the southwest, has been completed. The new line is laid with 60, 65 and 70-lb. rail and provides a short route from Memphis, Tenn., via New Mexico and Arizona, to southern California. The distance from Memphis to Tucumcari is 873.72 miles over this line. New station buildings have been put up at Vega, Tex., Adrian, Glenrio and at Endee, N. Mex., and San Jon. On the completion of the new line the C., R. I. & P. discontinued the operation of trains over the Fort Worth & Denver City Railway, from Amarillo to Dalhart, 82.06 miles. The traffic rights were therefore relinquished. (See report of this company elsewhere in these columns.)

Cincinnati, Hamilton & Dayton.—Double-tracking work is said to be under way on the main line south of Toledo, Ohio, on a section of 28 miles, also between Hamilton and a point several miles east of that place.

Dakota, Kansas & Gulf.—An officer writes that the prospects of building this line are fair, but that it has not yet been determined when contracts for the work will be let. The projected route is from Beloit, Kan., northwest via Ionia, Lebanon and Franklin, Neb., to Kearney, about 120 miles. W. H. Mitchell, president, Beloit, and F. T. Burnham, general attorney, 316 Dwight building, Kansas City, Mo. (July 15, p. 142.)

Fostoria & Fremont (Electric).—An officer writes that this company is now building from Fostoria, Ohio, northeast via Amsden, Kansas, Burgoon and Havens to Fremont, 21.4 miles. Grading is 90 per cent. finished and track laying is to be started about November 1. The line parallels the Lake Erie & Western, and traverses a rich agricultural district. It will provide a connection between the Western Ohio Railway and the Lake Shore Electric. F. D. Carpenter, president, and J. W. S. Riegle, chief engineer, Findlay, Ohio.

Foy & Illinois Union.—Incorporated in Illinois, with $25,000 capital and office at Aurora, Ill. The plans call for a line from Yorkville, Ill., north to Morris, with a connecting line west to Dwight, and an extension south to Sandwich. The incorporators include: J. Meredith, J. Rhodes, H. H. Evans, F. M. Zimmerman and R. C. Putnam, all of Aurora.

Grand River, Meeker & Salt Lake.—Incorporated in Colorado, with $10,000,000. The plans call for a line from the junction of the Denver & Rio Grande and the Colorado Midland, to be known as Chapman, on the Grand river, in Garfield county, west to Salt Lake City, Utah, about 300 miles. Some of the right-of-way has been secured. A contract is said to have been given to the Meeker-Rangely Construction Co., Denver, to build the line. The incorporators include: A. Muller, W. D. Lippitt, A. Friedman, W. P. Simmington and J. T. McClure, all of Denver.

Idaho & Western.—See Chicago, Milwaukee & Puget Sound.

Kentucky-Tennessee Traction.—An officer writes that it is expected to have surveys finished by December 1 for an electric line from Hopkinsville, Ky., southeast via Salubria Sulphur, Mineral Springs, Pembroke and Trenton to Guthrie, on the Louisville & Nashville, about 25 miles. It is the intention to extend the line south to Nashville, Tenn., and later from Hopkinsville north to the coal fields of Christian and adjoining counties. The line may be extended to Evansville, Ind., on the Ohio river. About 80 per cent. of the grants of private rights-of-way, 40 ft. wide, have been secured from property owners between Hopkinsville and Guthrie. It is expected that contracts for building and equipping the line will be let before January 1, 1911, and all the work carried out within 12 months. Charles Van den Burgh, associated with M. C. Forbes and N. Cathier, all of Hopkinsville; J. W. Cross, Pembroke; W. J. Dickinson, Trenton, and R. F. Warren, Guthrie, are interested.

Maine Roads.—The town of Skowhegan, Me., has voted to subscribe for $15,000 stock of a company which proposes to build a 12-mile line through Cornville to Athens. It is expected that the line will cost about $200,000. H. D. Eaton, Waterville, is the promoter.

Manitoba & Northwestern.—Application will be made to the parliament of Canada for an extension of time to build the following lines: From Yorkton, Sask., to Prince Albert; from Russell, Man., to the northern or western boundary of Manitoba; from a point between Portage la Prairie and Arden to the northern or western boundary of Manitoba; from some point between Westbourne and Beautiful Plains, northwesterly towards Lake Dauphin or Duck mountains; from a point between Theodore, Sask., and Insinger, to a point in Township 32, Range 18 or 19, W., second M., or Range 16 or 17.

Milwaukee Western Electric.—The stockholders have taken steps to secure funds for building from Milwaukee, Wis., northwesterly via Beaver Dam to Foxlake, with a branch from Sussex, via Pewaukee to Waukesha, in all about 80 miles. C. A. Chapman, Inc., Chicago, are the engineers. (Sept. 16, p. 510.)

National Railways of Mexico.—Surveys have been made, rights-of-way secured and bids are to be asked for soon, to build a branch from Allende, Coahuila, Mex., north to Las Vacas, on the Rio Grande, opposite Del Rio, Tex., about 80 miles. Bids will also be asked for soon to build a bridge over the Rio Grande for the joint account of this company and the Kansas City, Mexico & Orient, to connect with the line of the K. C., M. & O., now under construction from San Angelo, south to Del Rio. These improvements will provide a new route for traffic between the United States and Mexico. (July 1, p. 154.)

New York, Philadelphia & Norfolk.—An officer writes that a large amount of money is being spent for improvements on this line, and that double-tracking work is now under way. About 44 miles of the double-track is now in operation. A new station has been opened at Greenbush, Va., and the freight yard at Cape Charles has been enlarged.

New York Roads.—An officer of the Syracuse Railroad Construction Co., Syracuse, N. Y., writes that the question of building a line from Geneva, N. Y., to Port Gibson, is under consideration, but that no decision has yet been reached to carry out the work

Norfolk & Western.—An officer writes that contracts have been let for work on the line from Cedar Bluff, Va., on the Clinch Valley district, northwest to Canebrake, W. Va., on the Dry Fork branch, 15.5 miles, as follows: Rinehart & Dennis, 2.35 miles; Walton & Co., 2.6 miles; P. J. Millett, 2.9 miles; A. M. Valz, 1.76 miles, and W. O. Lipscomb, 1.84 miles, a total of 11.45 miles, to cost about $1,800,000. Work is already under way on the remaining four miles. Contracts are also let for construction of the North Fork branch of the Tug Fork branch on two miles to the Vaughan Construction Co., and on 2.3 miles to Carpenter & Boxley, a total of 4.3 miles, to cost $380,000.

Northern Pacific.—The report of this company for the year ended June 30, 1910, shows that the Oregon Trunk Railway is now building from a point near Clarke, Wash., on the Spokane, Portland & Seattle, south across the Columbia river, and up the Des Chutes valley to Bend, Ore., 156 miles. Second-track work has been finished from Lake Park, Minn., to Glyndon, 26.83 miles, with the exception of about one mile at Stockton. Grading work for second-track and a change of line and grade from St. Cloud, Minn., to Rices, 14.79 miles, will be finished this year and part of the track laid. The second-track between Philbrook, Minn., and Staples, 6.3 miles, and slight grade revision work will be finished by November 1, with the exception of one bridge, which will be double-tracked during 1911. In North Dakota grading has been finished and some of the second-track laid between Bloom and Jamestown, 4.99 miles. Grading is under way from Pingree, N. Dak., to Wilton, 92.5 miles, and will be finished this fall. No track or bridge material will be put in place during 1910. Grading is finished except for some small slides and deep cuts where no track is laid on the Missouri River Railway (Mandan North Line), 53 miles. From Mandan, N. Dak., north to Sanga, track has been laid on 28 miles. Completion of the work has been postponed until 1911. On the Missouri River Railway (Mandan South Line), 72 miles, grading is about finished and track has been laid from Mandan, south to Mile Post 42. No track will be laid beyond that point for the present. The Western Dakota Railway has been finished to Mott, N. Dak., 90 miles. Grading has been finished on the Glendive East Line, from Glendive, Mont., northeasterly along the Yellow Stone river, 55 miles, and piers for abutments of bridge across Yellow Stone river will be finished during 1910. The bridge will not be put up or any track laid until 1911. Grading is finished for second-track and change of line and grade between Huntley, Mont., and Billings, and eight miles of track will be finished and ready for operation during 1910. The line from Billings to Laurel, 15.36 miles, and the Shields River Valley Railway, 23 miles, have both been put in operation. It is expected that the second-track work will be finished from Missoula to De Smet, 7.02 miles, by December 15, and all the work on the Bitter Root extension to be carried out during 1910, 2.76 miles, has been finished. Second-track work will be finished this fall from Spokane, Wash., to Wins, 4.4 miles, and from Wins to Marshall similar work has been finished on 2.38 miles and the line is now in operation. Grading and track laying is finished on the Connell Northern Railway, from Connell, Wash., to Adrian, 62 miles, but the line will not be put in operation until 1911. Grading has been finished on the Ritzville branch, 38 miles, and part of the track will be laid in 1910. Investigation is being made of the character of the material along the Point Defiance line between Tacoma, Wash., and Tenino, but the work will not be begun until 1911. From Tenino to Vancouver second-track and grade changes are being carried out to provide the double-track main line with low curvature and low grades for joint use of the Northern Pacific, the Great Northern and the Union Pacific. The grading, bridging and track laying has been finished and the line is operated as double-track between Tenino and Chehalis, 14.5 miles. Grading between Chehalis and Kalama will be finished by November 15, as well as considerable of the track and bridge work. Double-track has

been completed on new line and grade and is now being operated from Kalama to Vancouver, 28.5 miles. In Oregon work has been finished and second-track is now in operation from North Portland to Portland, 3.26 miles. See report of this company elsewhere in these columns.

Oklahoma Roads.—According to press reports from Lawton, Okla., T. L. Poole, Oklahoma City, is back of a project to build from Wichita Falls, Tex., north to Lawton, about 55 miles.

Oregon Short Line.—An officer writes that work is now under way by the Utah Construction Co., Ogden, Utah, on a line from Montpelier, Idaho, westerly five miles to Ovid, thence southerly, 4.5 miles, to Paris. Maximum grades will be 0.3 per cent. and maximum curvature 6 degs. There will be six or seven pile trestles over Bear river. The line will carry agricultural products and live stock. (July 22, p. 174.)

Rock Island, Texico, Farwell & Gulf.—Contract is said to have been given to a construction company of Portland, Ore., for grading 100 miles from Farwell, Parmer county, Tex., south. The plans call for a line from Farwell, southeasterly to the center of Bailey county, thence south to a connection with the Texas & Pacific, about 200 miles. It is understood that the company will build shops at Farwell. M. J. Healy, Texico, N. Mex., may be addressed. (June 10, p. 1438.)

St. Francois County Railway.—Incorporated in Missouri, with $250,000 capital, to build a line connecting with the St. Louis, Iron Mountain & Southern at De Lassus, Mo., north via Farmington, to Esther. The incorporators include: W. M. Horlan, P. Giessing, E. Klein and W. R. Long.

Southern Pacific.—Incorporation has been asked for by a company to build from Mojave, Cal., northwesterly to Bakersfield. The line will go over the Tehachapi mountains. An incorporator is quoted as saying that it was necessary to form a new company to determine whether it will be more profitable to build a new line at a lower grade over the mountains, than to double-track the existing line between these two places. The directors include E. E Calvin, W. R. Scott and William Hood.

Spokane, Portland & Northern.—Incorporation has been asked for in the state of Washington by this company, with a capital of $10,000,000 and office at Spokane, Wash. The plans call for a line from Spokane, west to Bridgeford, thence north, crossing the Columbia and the Okanogan rivers to the international boundary near Nighthawk. A. M. Dewey, E. P. Spalding, S. A. Skinner, G. D. Needy and A. B. Lee, all of Spokane, are incorporators.

Stuttgart & Rice Belt.—An officer writes that work is now under way from Du Valls Bluff, Ark., south to Stuttgart, about 20 miles. Track has been laid on about three miles. H. Dalhoff, Little Rock, has the contract. The line will haul coal, timber, rice, hay and live stock. G. C. Lewis, president, Du Valls Bluff; D. A. McRea, chief engineer, Little Rock.

Union Terminal Railway.—Work will soon be started on a terminal railway system to connect Rockport, Tex., with the proposed deep water harbor and town of Port San Antonio; also on a line from the latter place to Navy City. An extension will eventually be built to Aransas Pass. C. T. Hoff, president, Rockport; W. H. Vernor, first vice-president; S. B. Rorenson, second vice-president, and W. D. Newberry, secretary.

Vandalia Railroad.—Surveys have been completed between Indianapolis, Ind., and St. Louis, Mo., for improvements to be made to include straightening the track, eliminating grades and constructing 25 miles of double-track between Effingham, Ill., and East St. Louis. The largest piece of work will be cutting down the big hill at Greenup. An entirely new right-of-way will be used.

Waterloo, Cedar Falls & Northern (Electric).—An officer is quoted as saying that plans have been made to extend this line from Cedar Falls, Iowa, southwest to Dike, Grundy county, about 10 miles. The line is ultimately to be extended to Grundy Center and Marshalltown.

Willapa Harbor & Coast Line.—Incorporated in the state of Washington, with $10,000,000 capital and office at Southbend, Wash., to build from Portland, Ore., north via Southbend, Wash., and North River to Tacoma. A number of branch lines are also to be built. J. L. Myers, J. W. Kleeb and F. H. Brown, all of South Bend, are directors.

Railway Financial News.

Aurora, Elgin & Chicago.—Stockholders have voted to buy the Chicago, Wheaton & Western.

Baltimore & Ohio.—See discussion of the annual report of this company elsewhere.

Boston & Maine.—Stockholders are to vote November 2 on the question of increasing the capital stock by the issue of $10,663,700 new stock. The proceeds of the sals of this stock are to be used for additions and improvements.

Chicago & Alton.—Brown Brothers & Co., New York, have sold $722,000 5 per cent. Chicago & Alton equipment notes dated October 1, 1910, and maturing 10 per cent. annually, beginning October 1, 1911.

Chicago, Indianapolis & Louisville.—Potter, Choate & Prentice, New York, are offering the unsold portion of $3,000,000 refunding mortgage 4 per cent. bonds of the Chicago, Indianapolis & Louisville of 1910-1947 at 95, yielding about 4¼ per cent. on the investment.

Chicago, Rock Island & Pacific.—Stockholders are to vote December 15 on the question of taking over the Chicago, Rock Island & El Paso, which is a subsidiary. The Ela Paso runs from Bravo, Tex., to Santa Rosa, N. M., 112 miles.

See discussion of the annual report of this company elsewhere.

Grand Rapids & Indiana.—This company has passed the semi-annual dividend usually declared at this time. Dividends have been paid at the annual rate of 3 per cent. since 1901. The company is controlled by the Pennsylvania Company, but is operated independently. A circular issued to the stockholders says that although gross earnings to September 30 showed a fair increase, as compared with previous year, operating expenses, taxes and other payments have so far increased as to leave the company without any net income applicable to dividends. The circular lays the blame of this condition in part on the recent national and state legislation.

Grand Trunk.—Application is to be made to the Canadian Parliament for permission to buy the Montreal & Southern Counties Railroad. This is a new electric road which runs from Montreal across Victoria Bridge to St. Lambert.

New York, Westchester & Boston.—The New York Public Service Commission, Second district, has authorized the New York, Westchester & Boston to issue $5,000,000 first mortgage 5 per cent. bonds of 1904-1954. The bonds are to be sold at not less than par.

Northern Pacific.—See discussion of the annual report of this company elsewhere.

Orange & North Western.—See St. Louis & San Francisco.

Pittsburgh, Shawmut & Northern.—Kidder, Peabody & Co., Boston, are offering $1,500,000 Pittsburgh, Shawmut & Northern 5 per cent. receiver's certificates of August 1, 1910-1915, at .96¾, yielding about 5¾ per cent. on the investment. The values of the properties in the receiver's hands aggregate, it is estimated, $25,000,000, of which $3,000,000 is the value of equipment.

Rutland.—W. K. Vanderbilt, Jr., George F. Baker and W. H. Newman have been elected directors, succeeding H. McK. Twombly, deceased, and Olin Merrill and Robert T. Paine, 2d, retired.

St. Louis & San Francisco.—The Texas Railroad Commission has granted permission to the Orange & North Western to issue $1,067,000 bonds on the thirty miles of road from Orange, Tex., to Newton. The bonds are to be deposited under the New Orleans, Texas & Mexico division mortgage of the St. Louis & San Francisco.

Wabash-Pittsburgh Terminal.—The Wallace Protective Committee has refused the request of the Chapin Protective Committee to return the $450,000 bonds owned by the Colonial Trust Co. of Pittsburgh. The question of the return of these bonds will be taken to the courts as a test case. The bonds were deposited with the Wallace Committee in May, 1908, under a five-year agreement; but the Chapin Committee takes the position that as two and a half years have passed with no action by the Wallace Committee, that committee has forfeited its rights.

Supply Trade Section.

The Panama Railroad is offering for sale six locomotives which are now in use on the Isthmus of Panama. Wendell L. Simpson, assistant purchasing officer, New York.

The McKeen Motor Car Company, Omaha, Neb., delivered on its own wheels and under its own power, a 70-ft. motor car to the Southern. The car traveled over the Wabash, C., N. O. & T. P. and Southern.

The Isthmian Canal Commission will receive bids until November 14 for electrical material, including fittings, fixtures, insulating material, line material, tools, wire, electric and steel cable, etc. (Cir. No. 611.)

Geo. F. Thomas, assistant general freight agent of the Chicago Great Western at St. Paul, Minn., has resigned to become secretary and treasurer of the Moore Patent Car Company, owners of a design of refrigerator cars.

The Chicago offices of the T. H. Symington Company, Baltimore, Md., will on November 1 be moved from the Railway Exchange to 623-625 People's Gas building. In addition to its journal boxes, this company also handles the Farlow draft gear.

G. S. Vickery, chief draftsman of the frog and switch department of the Pennsylvania Steel Company, Steelton, Pa., has been appointed acting superintendent of the department, succeeding Mr. Reinochl, whose death was noticed in these columns last week.

Crerar, Adams & Company, Chicago, will move into their new warehouse and office, located at 239-259 E. Erie street, corner Fairbanks court, on November 1. This company has been located at the corner of Fifth avenue and South Water street continuously since 1858, with the exception of a year following the Chicago fire, and in that location have become well known as distributors of railway supplies. The new warehouse is large, fireproof, equipped with the latest devices for prompt handling of material, and will allow the company to carry a much larger stock and better handle its growing business.

The Northern Engineering Works, Detroit, Mich., is completing an addition to its crane erecting shop. The new building is approximately 160 ft. x 60 ft., of fireproof structural steel and brick construction, with steel sash. Three cranes and two overhead trolley-runs will serve the floor. Electric and pneumatic hoists will be used. The machinery has been installed and the building will be occupied this month. A new storage yard for structural steel has been arranged for alongside the addition and is covered by a 60-ft. span, three-motor electric Northern gantry crane of special construction. The company reports the largest demand in its history for its electric cranes and other products.

The Lemac Carriers Company and the Ryan Car Company have appealed to the United States Circuit Court of Appeals for the Seventh Circuit from the decision of Judge Kohlsaat, of the circuit court at Chicago, in which Judge Kohlsaat enjoined the Lemac Carriers Company and the Ryan Car Company from alleged infringing on a patent obtained by F. X. Mudd, general manager of the Live Poultry Transportation Company, for improvements in poultry cars. (See *Railway Age Gazette*, October 21, page 762.) The Lemac Carriers Company and the Ryan Car Company have filed bonds, and pending the decision of the United States Circuit Court of Appeals, the effectiveness of the decision of Judge Kohlsaat is suspended, so that no injunction is in force at the present time, nor can the injunction be enforced, of course, unless the decision of the lower court shall be upheld.

Charles E. Randall, railway representative of Manning, Maxwell & Moore, New York, died in Buffalo, N. Y., on October 22, at the age of 69. On account of the death of his father, Mr. Randall began work when but 14 years old, becoming an apprentice in the Taunton Locomotive Works. At 25 he took a position as chief engineer on a steamboat. Several years later he entered the employ of the Hartford Steam Boiler Works, at East Boston, Mass., where he remained until 1879. On June 1, 1881, he became mechanical engineer and salesman for the Hancock Inspirator Company, with which work he has been connected since that time. When Manning, Maxwell & Moore, purchased the Hancock Inspirator Co., in 1900, Mr. Randall became associated with this company, and has represented its allied industries, The Ashcroft Manufacturing Company, The Consolidated Safety Valve Company, The Hayden & Derby Manufacturing Company and The Hancock Inspirator Company. The funeral was held at Boston on October 25.

RAILWAY STRUCTURES.

BANGOR, ME.—The Railroad Commission of Maine has issued a certificate of necessity to the Maine Central for taking land needed to carry out improvements. The company proposes to enlarge the upper part of the yard alongside the main line to Bangor and the branch line to Skowhegan.

CHICAGO.—The Pennsylvania has secured property south of Polk street, between Stewart avenue and the Chicago river, for an extension of the company's freight terminal. The reported price paid for the site is $1,800,000.

COEUR D'ALENE, IDAHO.—See Chicago, Milwaukee & Puget Sound under Railway Construction.

DETROIT, MICH.—A contract has been given to the Detroit Bridge & Steel Co. for putting up a steel and concrete bridge to be 315 ft. long over the Michigan Central tracks at 14th street in Detroit. The improvements will cost $32.275.

EAST ST. LOUIS, ILL.—The Clover Leaf-Alton freight houses were burned October 20. The loss included a number of loaded freight cars. The estimated value of the property destroyed is $500,000.

GUELPH, NEV.—An officer of the San Pedro, Los Angeles & Salt Lake writes that on the line which is being built on higher ground than the existing line between Guelph, Nev., and Crestline, there will be 15 steel bridges, each from 150 ft. to 300 ft. long, and eight tunnels.

HANNIBAL, MO.—The pattern and saw shops of the Chicago, Burlington & Quincy were burned October 23. Three workmen were injured and an estimated loss of $100,000 is reported.

MEXICO CITY, MEX.—The shops of the National Railway of Mexico were partially burned on October 16, due to a boiler explosion. The loss is estimated at $200,000.

NEW YORK.—The new station of the Hudson & Manhattan at Broadway and 33rd street, in the borough of Manhattan, will be opened for traffic on November 10. The new station will have five entrances from the street, one on the northwest corner of Broadway and 32nd street, three under the elevated stairs and one through the Gimbel store property. There are 12 staircases leading from the Concourse to the track platforms below.

OAKLAND, CAL.—The Southern Pacific is building a new power plant at the West Oakland yards for use in connection with the proposed electrification of the Oakland and Alameda line.

PHILADELPHIA, PA.—An officer of the Philadelphia & Reading writes that contracts have been let for work between Somerset street and Trenton avenue, on the Richmond branch, as follows: For masonry and embankment work, to John McMenamy, Philadelphia, at $117,425, the work to be completed within 300 days, and for the bridges ready for ballast, to the American Bridge Co., at $125,428, the work to be finished within 175 days.

SAN BERNARDINO, CAL.—The Atchison, Topeka & Santa Fe will put up a recreation hall in connection with the shops at San Bernardino, to cost $5,000.

SAN DIEGO, CAL.—The Atchison, Topeka & Santa Fe has given a contract for a new station at Delmar, near San Diego, and will commence work early next year on new freight sheds at San Diego.

SOMERSET, PA.—It is understood that the ordinance to permit the Baltimore & Ohio to make improvements in Somerset will be passed. The plans call for building a new passenger station.

TEXAS CITY, TEX.—The Texas City Transportation Company has announced its intention of building 10 miles of additional yard tracks, a new steel and concrete warehouse 100 ft. by 750 ft., a new fireproof station at Tenth street and Tenth avenue, N., and a fireproof office building at the docks.

Late News.

The items in this column were received after the classified departments were closed.

B. H. Da Costa has been appointed a traveling freight agent of the Central of Georgia, with office at New York, effective November 1.

The Pan-American Railway is said to be in the market for 500 freight cars, including flat, box, dump and gondola cars, for 50 passenger cars and also a number of locomotives. This item is not confirmed.

The Oregon & Washington expects to open for operation January 1, 1911, a branch from Cosmopolis, Wash., south to Brooklyn, in Pacific county, 30 miles. The line is being built through a heavy timber section.

Alfred Craven, deputy engineer of the New York Public Service Commission, First district, at New York, has been appointed engineer in charge of subway construction, succeeding George S. Rice, resigned.

The Greenbrier, Cheat & Elk River has started work on a line from Bemis, W. Va., to Webster Springs, about 75 miles. The work includes piercing an 800-ft. tunnel. S. E. Slaymaker, president, 200 Fifth avenue, New York.

The Interstate Commerce Commission in an opinion by Chairman Knapp in the case of Chicago Car Lumber Co. v. Louisville & Nashville, has awarded reparation on four carload shipments of railway ties between Tennessee Ridge, Tenn., and Louisville, Ky. (19 I. C. C., 438.)

The Fairburn & Atlanta Railway & Electric Co. has grading work finished and will let contracts soon to complete a line from College Park, Ga., to Fairburn, 10.5 miles. There will be one steel bridge, 81 ft. long. W. T. Roberts, president, and L. W. Roberts, chief engineer, Atlanta.

A contract is said to have been given by the Northwestern Pacific to the Utah Construction Co., Ogden, Utah, for building 32 miles of line between Willits, Cal., and Eureka. The contract calls for heavy railway construction, including 11 tunnels, varying in length from 200 ft. to almost a mile.

The Oberlin, Hampton & Eastern has given a contract to the Williams Brothers Co. to build from Oberlin, La., southeast to Hampton, nine miles. The line may eventually be continued east to Eunice. It is expected to have the track laid during 1910. W. B. Williams, president, Oberlin, and O. L. Reiszner, engineer, Le Compte.

The Texas, Oklahoma & Eastern has been incorporated in Oklahoma, with $200,000 capital, to build from Valliant, Okla., east through a timber section to Mountain Fork river, 30 miles. H. Dierks, H. L. Dierks, A. E. Hart, J. S. Kirkpatrick, all of Kansas City, Mo.; S. B. McCartney, Bismarck, and J. H. Crook, Idabel, Okla., are interested.

The Indiana Railroad Commission is to investigate the possibility of a car shortage. "One reason for the shortage," says Chairman Wood, "is the fact that under a ruling of the Interstate Commerce Commission a railway is compelled to pay only 25 cents a day for a car belonging to another company which it appropriates to its own use. The roads have found it cheaper to pay the nominal sum than to build cars, while they do not relish the idea of building cars for their own use when they are likely to be seized by another company and used for an indefinite time at the price set out in the ruling. It seems to me that it will be necessary to readjust the ruling in the interest of better shipping facilities."

The Interstate Commerce Commission in an opinion by Commissioner Clements has decided the case of the Southern Cotton Oil Co. v. Atlantic Coast Line Railroad et al. Crude cottonseed oil shipments were made into Savannah, Ga., on local rates from points in Georgia and Alabama, there refined and then reshipped on balance of through rates from various points of origin to ultimate destinations. Between the inbound and the outbound movements the rates had been advanced 2 cents per 100 lbs., and defendants applied on these shipments the higher through rates in effect at time of reshipment. On complaint that the higher charges were unlawful, it is held that the legal rates applicable on these shipments were the rates in effect at the time of the initial movement. Reparation awarded. (19 I. C. C., 434.)

The Missouri, Kansas & Texas has filed application with the Texas Railroad Commission to take over and operate as a part of its system the Texas Central, which it recently acquired. It is proposed to do this under a five-year lease as an actual merger of the two companies cannot be done except by enactment of the legislature. The official recognition of the two roads as being under the same management will make the single line rate apply over the connecting roads instead of the joint line rate as at present. This would mean a large saving to the shippers. In its application to the commission the Missouri, Kansas & Texas agrees to follow the policy of the former owners of the Texas Central of extending that line west through the lower Panhandle to Roswell, N. Mex., a distance of about 350 miles, and to complete the branch line that is being now built from De Leon to a point 40 miles west of there.

In regard to the threatened coal famine in Chicago, President Ogara, of the Ogara Coal Co., the largest shippers of Illinois coal, says: "Organizations of consumers have fought tooth and nail to prevent the railways from receiving a just increase of 10 or 15 cents a ton on coal. The result is that the consumer will have to pay from $2 to $3 instead of 10 cents a ton more than last year. The railways were discouraged by the attitude of shippers and consumers, and few of them have spent a dollar for new cars or facilities for handling coal. Hundreds of cars have been discarded since last winter, and the railways will not be able to furnish the coal demanded with the first turn of cold weather. We have been short about 50 cars a day of our orders and expect worse conditions. I look for coal to be higher this winter than any year since the famine of 1902-3, when prices doubled in two months. Perhaps the consumers will be willing next year to let the railways earn a profit on their Illinois business."

At the annual meeting of the stockholders of the New York, New Haven & Hartford Wednesday the number of directors was increased from 25 to 27. The three new directors are T. DeWitt Cuyler, of Philadelphia, a member of the Pennsylvania board; A. S. May and A. E. Clark. The directors were empowered to pension employees for long and efficient service. A resolution was approved concerning the purchase by the company of the Berkshire Railroad Company at a cost of $1,887,725. The purchase of the New Haven & Northampton for $984,000 and the purchase of the Rhode Island & Massachusetts Railroad for $191,700 was also approved. President Mellen in explaining why the stockholders were asked to vote on the question of pensions said the board had been granting pensions from time to time and believed that the pension system tends to give better service and secure more faithful performance of duties by employees. A doubt, however, has been expressed as to whether or not the directors can legally vote such pensions.

Shippers began introducing testimony at the western rate advance cases Wednesday. H. C. Wallace, editor *Iowa Farmer*, testified that farmers are unable to make enough money earn reasonable interest. Counsel for railways on cross examination made Mr. Wallace admit that Iowa land had been largely increasing in value, that farmers buy automobiles and are receiving high prices for crops. The point was also brought out that farmers lived off their farms and that what Mr. Wallace meant was they were not able to earn interest after paying all family expenses. Shippers put on the stand H. G. Wilson, transportation commissioner of the Kansas City Commercial Club; W. P. Trickett, transportation commissioner of the Minneapolis Board of Trade, and E. J. McVann, transportation commissioner of the Omaha Chamber of Commerce. Mr. Wilson and Mr. Trickett said that railways formerly gave large rebates which they do not give now, and that if they were able to prosper when they were giving rebates they ought to prosper now when they are not giving them. John Barton Fayne, counsel for the Chicago Great Western, asked Mr. Trickett specific cases of rebating. After considerable cross examination Mr. Trickett said he would get advice of counsel and answer the question regarding specific cases later.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Mintah Railway, Philadelphia, Pa., has ordered one consolidation locomotive from the Baldwin Locomotive Works.

CAR BUILDING.

The Pennsylvania has ordered 40 all-steel passenger cars from the American Car & Foundry Company.

The Bingham & Garfield, McCormick building, Salt Lake City, Utah, will soon be in the market for several hundred steel ore cars.

The Hawley Lines, reported in the *Railway Age Gazette* of June 17 as figuring on 8,000 freight cars, are now receiving revised prices on this equipment.

The Norfolk & Western, reported in the *Railway Age Gazette* of September 30 as being in the market for 500 fifty-ton hopper cars, will build this equipment in its own shops.

The Louisville & Nashville, reported in the *Railway Age Gazette* of September 16 as being in the market for 100 ballast cars, has ordered this equipment from the Rodger Ballast Car Company.

The Hudson & Manhattan, reported in the *Railway Age Gazette* of September 30 as being in the market for steel subway cars, has ordered 30 of these cars from the Pressed Steel Car Company.

The Lehigh Valley has ordered 40 all-steel vestibule passenger coaches from the Pullman Company. They are to be delivered in March and April of next year. Two combination baggage-library-buffet cars, each 75 ft. long and containing chairs for 23 passengers, have also been ordered from the Pullman Company.

IRON AND STEEL.

The Norfolk & Western is said to be in the market for 15,000 tons of 100-lb. rails for 1911 delivery.

The Atchison, Topeka & Santa Fe has ordered 600 tons of bridge steel from the American Bridge Company.

The Baltimore & Ohio has ordered 400 tons of bridge steel from the McClintic-Marshall Construction Company, and 200 tons from the American Bridge Company.

General Conditions in Steel.—While rail orders have been small, prospective business is beginning to show up. It is understood that a large number of railways are just now making up estimates for 1911 requirements. Four railways, the Atchison, Topeka & Santa Fe, the Pennsylvania, the New York Central and the Harriman Lines will, it is said, consume in the neighborhood of 500,000 tons. Generally, the outlook for the steel companies is much brighter than it has been for the past six months. The quarterly statement of the United States Steel Corporation, as of September 30, shows net earnings of $37,365,187, which is in access of the estimated $37,000,000.

SIGNALING.

A correspondent at Spokane writes:

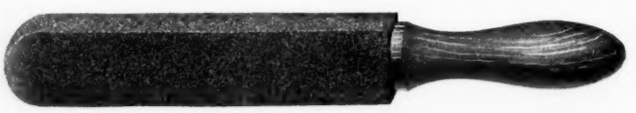
The Washington Water Power Company has just installed on its suburban electric railway between Spokane and Cheney and Medical Lake, Wash., 27 miles, a complete system of automatic electric block signals and an automatic stop. If the stop signal is disregarded, an iron bar, lowered with the semaphore, will break a glass tube on the top of the leading car and apply the brakes. The signals, which are three-position upper-quadrant with top-post mechanism, are controlled by track circuits with overlaps. Instead of remaining at "safety," the lights in the signals, which show green for clear and red for stop, are twin two-candlepower incandescent electric.

The Great Northern is to equip 59 miles of its line with electric train staffs. This installation will be an extension of the train staff operation through the Cascade tunnel, which has been in effect several years. The termini of the line now to be equipped are Leavenworth and Skykomish. There will be 17 block sections and 34 staff instruments. Thirty-two of these will have permissive attachments and at 16 stations there will be staff cranes, by means of which staffs will be taken up by trains without reducing speed. There will be home and distant approach signals at every station, by which the operator will have complete control of the movement of trains into the side tracks, this arrangement being similar in principle to that which is in use on the Southern Pacific, and which was described in the *Railway Age Gazette* of May 21, 1909.

The second regular meeting of the Chicago Signal Club for October was held on October 24. Hibbard S. Greene, of the Nungesser Electric Battery Company, read a paper on "Dry Batteries for Ignition Service" and in the discussion following, many important points regarding the preventing of battery failures on motor cars were brought out. Mr. Lavarack led a discussion on "Detector Track Circuits vs. Detector Bars." The next meeting will be held November 14 and the subjects for discussion will be "The Relative Merits of Series and Shunt Circuits for Side Track Protection," and "The Mercury Arc Rectifier for Charging Signal Storage Batteries." W. E. Foster, of the Ingalls-Shepard Forging Company, will read a paper on "Standard Specifications for Mechanical Interlocking." It was decided to invite all supply men to every regular meeting instead of to alternate meetings, as has been the custom.

Carborundum File.

The carborundum file is the latest carborundum product designed to assist in and quicken operations for railway shop men. It is made to do the same work as the steel file on all kinds of castings and metal pieces. It is claimed that it will outlast the



Carborundum File.

steel file, and that it is very useful for touching up case-hardened parts and removing scale from the hard metal.

The carborundum file is a rectangular solid block, 13 in. long, 1½ in. wide and 1½ in. thick. Carborundum, as is well known, is a hard and sharp abrasive material. Every grain or grit in the file is so hard and sharp that the results from using a file made from such material can be readily appreciated.

This file may be obtained from hardware dealers, or from the Carborundum Company, Niagara Falls, N. Y.

FOREIGN RAILWAY NOTES.

The total length of the running track of the railways of the United Kingdom at the end of 1909 was 39,622 miles, and the total length of sidings was 14,350 miles. At the end of 1908 the length of running track was 39,316 miles.

At the end of 1909 the length of line in Great Britain (in equivalent of single track) operated solely by electricity was 204½ miles, and some 229¾ miles were being operated partly by electricity. The corresponding lengths of line at the end of 1908 were 204½ and 200½ miles respectively. The total quantity of electrical energy used in 1909 was 253,294,628 Board of Trade units.

The proposed railway to connect the Pacific coast with the Upper Ucayali river is to be commenced shortly, according to a report on the trade of Iquitos, Peru. It will start from Cerro de Pasco, to which point a railway already exists, and reach the river at a point called Pucalpa, about four days above Iquitos by steamer. Vessels of about 250 to 300 tons, but of light draught, can reach this point at any time of the year. It is understood that the engineers who made the initial survey encountered fewer difficulties than they had anticipated, and that they have hopes of completing the line in three years. They have now returned to Lima to complete arrangements and intend starting work at both ends as soon as possible. The contracting firm is a United States one and the estimated cost of the railway is $15,000,000.

ANNUAL REPORTS.

BALTIMORE & OHIO RAILROAD COMPANY—EIGHTY-FOURTH ANNUAL REPORT.

Office of the Baltimore & Ohio Railroad Company,
Baltimore, Md., Sept. 22, 1910.

To the Stockholders of the Baltimore & Ohio Railroad Company:

The president and directors herewith submit report of the affairs of the company for the year ended June 30, 1910.

The statements following show the operations of the properties of the entire system, excepting the Staten Island Railway Company, the Staten Island Rapid Transit Railway Company and the Baltimore & Ohio Chicago Terminal Railroad Company, and cover 4,434.39 miles of road.

OPERATING RESULTS FOR THE YEAR ENDED JUNE 30, 1910, COMPARED WITH THE YEAR ENDED JUNE 30, 1909.

Rail operations.	1910.	1909.	Increase.
Miles of road operated	4,434.39	4,459.90	*25.51
Earnings:			
From freight traffic	$69,408,112.68	$58,355,111.83	$11,053,000.85
From passenger traffic	14,485,585.09	13,551,238.28	934,346.81
From express traffic	1,715,156.97	1,523,617.39	191,539.58
From transportation of mails	1,176,843.75	1,255,966.57	*79,122.82
From misc. transportation	1,327,726.42	1,038,036.69	289,689.73
From operations other than transportation	787,827.46	688,885.52	98,941.94
Gross earnings	$88,901,252.37	$76,412,856.28	$12,488,396.09
Expenses:			
For maintenance of way and structures	$11,661,409.75	$9,694,559.96	$1,966,849.79
For maintenance of equipment	16,373,775.93	11,810,507.06	4,563,268.87
For traffic expenses	1,877,203.56	1,717,388.14	159,815.42
For transportation expenses	29,738,992.09	26,346,969.16	3,392,022.93
For general expenses	1,682,419.46	1,594,556.55	87,862.91
Total expenses	$61,333,800.79	$51,163,980.87	$10,169,819.92
Percentage of expenses to earnings	68.99	66.96	2.03
Net earnings from operation	$27,567,451.58	$25,248,875.41	$2,318,576.17
Outside operations:			
Total revenue	$1,262,148.72	$1,150,593.67	$111,555.05
Total expenses	1,861,782.42	1,689,843.03	171,939.39
Net revenue	†$599,633.70	†$539,249.36	†$60,384.34
Total net revenue	$26,967,817.88	$24,709,626.05	$2,258,191.83
Taxes accrued	2,469,964.17	2,271,575.72	198,388.45
Operating income	$24,497,853.71	$22,438,050.33	$2,059,803.38

*Decrease. †Deficit.

The operated mileage for the year was 4,434.39 miles, as against 4,459.90 miles in 1909, the difference being due to a revision of statement of first track mileage to conform more closely to the classification required by the Interstate Commerce Commission, there being no practical change in the mileage as operated, compared with previous year.

The gross earnings from rail operations were $88,901,252.37, an increase of $12,488,396.09, or 16.34 per cent.

The earnings from freight traffic increased $11,053,000.85, or 18.94 per cent. The tons of freight carried were 62,797,745, an increase of 11,587,584, and the total ton mileage was 12,024,583,527, an increase of 1,975,302,682, or 19.76 per cent. The average freight earnings per ton per mile were .577 cents, compared with .581 cents the previous year, a decrease of .69 per cent.

The earnings from passenger traffic were $14,485,585.09, an increase over preceding year of $934,346.81.

The total number of passengers carried was 21,107,120, an increase of 1,210,568, and the total passenger mileage was 763,448,759, an increase of 42,690,027. The average earnings per passenger per mile were 1.897 cents, as against 1.880 cents in 1909.

Earnings from express traffic increased $191,539.58. There was a decrease of $79,122.82 in receipts for facilities furnished and transportation of mails. This was principally due to reductions ordered in rates of pay. Recent reweighing on parts of the system shows marked increase in the amount of mail matter carried.

Operating expenses for the year were $61,333,800.79, an increase of $10,169,819.92, or 19.88 per cent.

The maintenance expenditures, road and equipment, show an increase of $6,530,118.66.

Transportation expenses increased $3,392,022.93; other increases being $159,815.42 in traffic expenses and $87,862.91 in general expenses.

Tables herewith show the expense items in detail and more particularly the sub-accounts making up these increased expenditures, which were largely incident to increased volume of traffic handled during the year, the more liberal maintenance expenditures rendered practicable by the increased earnings and the increased rates of pay which were effective for a portion of the year.

The general income account of the company for the year is made upon the same consolidated basis indicated above as to operations and includes the various properties, component parts of the system, the fixed charges of which have heretofore been assumed, and the capital assets and liabilities now taken up in the company's balance sheet. Upon this basis the income account for the year ended June 30, 1910, after payment of taxes, interest on funded debt and other charges, shows net corporate income to have been $16,247,587.03. From this, however, should be deducted expenditures for betterments necessary to meet changed conditions and to maintain the earning capacity, but of a character not heretofore capitalized, $415,760.61, leaving a final balance of $15,831,826.42. The dividends of 4 per cent. on the preferred and 6 per cent. on the common stock aggregated $11,474,212.79, showing surplus earned over dividends for the year of $4,357,613.63.

GENERAL INCOME ACCOUNT OF THE BALTIMORE & OHIO RAILROAD, YEAR ENDED JUNE 30, 1910, IN COMPARISON WITH THE YEAR ENDED JUNE 30, 1909.

	1910.	1909.	Increase or decrease.
Total operating revenue	$88,901,252.37	$76,412,856.28	$12,488,396.09
Total operating expenses	61,333,800.79	51,163,980.87	10,169,819.92
Net operating revenue	$27,567,451.58	$25,248,875.41	$2,318,576.17
Outside operations:			
Total revenue	$1,262,148.72	$1,150,593.67	$111,555.05
Total expenses	1,861,782.42	1,689,843.03	171,939.39
Net revenue	†$599,633.70	†$539,249.36	†$60,384.34
Total net revenue	$26,967,817.88	$24,709,626.05	$2,258,191.83
Taxes accrued	2,469,964.17	2,271,575.72	198,388.45
Operating income	$24,497,853.71	$22,438,050.33	$2,059,803.38
Other income:			
Rents—			
Joint facilities—total receipts	$495,521.00	$548,172.58	*$52,651.58
Miscellaneous rents—total receipts	466,973.88	500,527.68	*33,553.80
Dividends on stocks owned	1,541,777.41	1,453,851.62	87,925.79
Interest on bonds owned	202,968.26	205,899.90	*2,931.64
Other interest	1,381,863.42	526,076.40	855,787.02
Western Union Telegraph Company annuity	60,000.00	60,000.00	.....
Miscellaneous income	68,794.04	52,728.77	16,065.27
Total other income	$4,217,898.01	$3,347,256.95	$870,641.06
Gross corporate income	$28,715,751.72	$25,785,307.28	$2,930,444.44
Deductions from gross corporate income:			
Rents—			
Hire of equipment—net balance	$437,653.06	$210,137.95	$227,515.11
Joint facilities — total payments	853,377.04	923,990.05	*70,613.01
Miscellaneous rents—total payments	170,298.43	146,098.50	24,199.93
Interest on funded debt	10,644,867.67	10,180,463.05	464,404.62
Other interest	353,002.16	587,420.01	*234,417.85
Other deductions account subsidiary lines	8,966.33	1,192.00	7,774.33
Total deductions from income	$12,468,164.69	$12,049,301.56	$418,863.13
Net corporate income	$16,247,587.03	$13,736,005.72	$2,511,581.31
Deduction for additions and betterments expended during the year	415,760.61	549,572.24	*133,811.63
Balance net corporate income	$15,831,826.42	$13,186,433.48	$2,645,392.94

Balance net corporate income			*$15,831,826.42
Dividend payments:		Increase.	Decrease.
Preferred—March 1, 1910, 2%	$1,177,848.80	.....	.....
Sept. 1, 1910, 2%	1,177,826.09	$2,355,674.89	.....
Common—March 1, 1910, 3%	$4,559,125.06	.....	.....
Sept. 1, 1910, 3%	4,559,412.84	9,118,537.90	11,474,212.79
			$4,357,613.63
Amount to credit of profit and loss, June 30, 1909		$18,120,681.37	.....
Add sundry adjustments due to incorporating subsidiary lines, deferred interest and other items, net credit balance		898,805.33	19,019,486.70
Amount to credit of profit and loss, June 30, 1910			$23,377,100.33

*Decrease. †Deficit.

NOTE.—For purpose of comparison, the income account of 1909 has been restated, by eliminating debits and credits account of interest on bonds and dividends on stocks of own issue, in treasury, to accord with ruling of Interstate Commerce Commission.

The general balance sheet, table 2, is presented for this year in the form prescribed by the order of the Interstate Commerce Commission, effective June 15, 1910. This change prevents the showing of parallel comparisons with the general balance sheet of the preceding year.

There has been, however, an increase in the total footings, compared with June 30, 1909, of $78,593,661.85.

The principal changes in liabilities are as follows:

Increase in common stock of $41,000, issued in exchange for like amount of Ten Year Gold Convertible Debenture 4 per cent. bonds of the company. Increase in Mortgages and secured debt of $53,041,014.36, due to issue of $40,000,000 Three Year Gold Secured Notes; the issue under provisions of the First Mortgage of $1,000,000 Four Per Cent. Bonds, and $12,041,014.36, the net increase incident to taking into the General Balance Sheet the funded debt of Subsidiary Lines, viz.: $19,689,100, interest payments on which have heretofore been assumed, but principal had not been taken up in Capital Liabilities, less $7,644,070, account Pittsburgh Junction & Middle Division Bonds, heretofore carried as liability, contra the deposit of these bonds with the Trustee of the Pittsburgh, Lake Erie & West Virginia Mortgage.

Increases are also shown in Working Liabilities, chiefly due to issue of ten million dollars One Year Four Per Cent. Notes; in "Appropriated Surplus," wherein $10,965,168.91 represents net amount restored to this account and charged to Cost of Road and Equipment, as elsewhere explained in more detail, and in Profit and Loss Account, due to items incident to incorporating Subsidiary Lines, and to sundry adjustments under the revised classification.

The principal changes in assets are as follows:

Increase in cost of road, $38,864,766.34; due to charges in taking up subsidiary line assets, $19,689,100, per contra, funded debt assumed; new

construction during the year, $5,549,819.56; charged to construction account against the "Appropriated Surplus for Improvements," years 1900-1907, $19,481,329.26; less credits, account equipment B. & O. S. W. R. R., formerly carried in cost of road, $4,692,146.98, and sundry adjustments, $1,163,335.50.

Increase in cost of equipment, $18,582,581.41, due to transfer to this account equipment of the Baltimore & Ohio Equipment Company, the Baltimore & Ohio Southwestern Railroad and other subsidiary companies, $23,643,843.63; new equipment acquired during the year, $9,013,021.59, less credits incident to revaluation, and equipment put out of service, $8,025,302.30, and less reserve for accrued depreciation, $6,048,981.51.

The further increase of $21,146,314.10 occurs in securities and working assets, due principally to increase of $36,400,614.93 in cash and loans and bills receivable, the latter representing the unexpended balance of your $40,000,000 Three Year Gold Notes, less transfer to "Property Investment," Baltimore & Ohio Equipment Company equipment, $16,988,317.50, and sundry other adjustments to conform to new classification.

IMPROVEMENTS CHARGED TO INCOME.

In the last annual report reference was made to charges to income during the period from July 1, 1899, to June 30, 1909, for capital improvements aggregating $21,540,230.68. Of this amount $19,481,329.26 has been charged to cost of road, and accounts credited, viz., equipment accounts, more particularly referred to under caption equipment, $8,516,160.35, and appropriated surplus, additions to property, $10,965,168.91.

ADDITIONS TO ROAD AND EQUIPMENT.

Much of the country dependent as yet upon your lines for transportation is rich in natural resources, and there is every indication that the already large industrial development will be greatly extended. Aside from the possibilities referred to, it became evident during the year that in order to handle satisfactorily the business already offering, it was essential to make immediate provision for additional equipment and other facilities. To meet this situation your board authorized the purchase of 284 locomotives and 15,000 freight cars, approximate cost of which is $23,000,000, and various improvements, more particularly referred to elsewhere in this report, the expenditures for which, estimated at about $20,000,000, will extend over eighteen to twenty-four months. To better care for the increasing passenger traffic, authority was given for the purchase of 26 locomotives and 70 pieces of passenger train equipment of modern design and equipped for electric lighting, which system of lighting has now been introduced on through trains. Table 14 shows such of this equipment as was delivered during the year.

To make payment for equipment as acquired and to meet construction expenditures as work progresses, it was necessary to issue additional securities. The company issued its Ten Million Dollar, One Year Four Per Cent. Gold Notes, due March 10, 1911. Subsequently an issue of fifty million dollars of Four and One-Half Per Cent. Three Year Gold Coupon Secured Notes, due June 1, 1913, was authorized. Ten million dollars of these notes are reserved to retire the one year notes referred to, and the remaining forty million were sold, and proceeds are available for the contemplated expenditures for equipment and construction.

CONSTRUCTION AND BETTERMENTS.

Much of the work previously undertaken was completed during the year, and the remainder, together with extensive additional work undertaken, has been vigorously prosecuted. The improvements started during the year are in pursuance of a general scheme for the betterment of the line to facilitate the handling of traffic and render the operations more effective and economical. In addition, to meet present conditions, it has been necessary to undertake extensive work for the elimination of grade crossings, more particularly in the cities of Baltimore, Md.; Columbus, Ohio, and Chicago, Ill.; also to continue the rebuilding and strengthening of bridges on the system for heavier power.

Some of the more important improvements completed during the year were:

The new double-track bridge over the Susquehanna River, completed and put in use January 6, 1910.

The viaduct, known as Bridge 68, at Cumberland, referred to in previous report as being widened and reinforced to carry heavier power, finished in November, 1909.

To relieve the Wheeling Division and facilitate the handling of traffic westbound, a connection, including bridge over the Monongahela River, was constructed between Haywood, W. Va., on the Monongah Division, and Lumberport, W. Va., on the Ohio River Division. This work was undertaken in March, 1910, and line opened June 14, 1910.

The new double-track draw bridge over the ship canal at Indiana Harbor was completed.

New station buildings were completed at Listie, Pa.; Fairpoint and Warren, Ohio, and Gary, Ind., the last mentioned being owned and operated jointly with the Lake Shore & Michigan Southern Railroad Company.

Following is shown some of the more important work now under construction, most of which it is anticipated will be completed during the next fiscal year:

Additions to Track and Betterment of Road.

Change of line and grade reduction, Concord to Wilmington, Del., 1.1 miles, including stone viaduct, replacing steel bridge, over Brandywine Creek.

Additional third track, Sir John's Run to Great Cacapon, about 5 miles, giving continuous third track from Hedgesville to Orleans Road, about 34 miles, and the installation of automatic block signals, rendered necessary by the increased density of traffic on the Cumberland Division.

Construction of 1½ mile siding near Bond to relieve westbound movement of freight on Seventeen Mile Grade.

Extension of third track, 2½ miles eastward from Swanton, for use of westbound freight trains.

Revision of line and change of grade to obviate use of helpers between Hutton and Corinth.

Extension of third track, from West of Terra Alta to Rodemer, about 4 miles, including elimination of tunnels at McGuires and Rodemer. This will complete the third track from Rowlesburg to Terra Alta and will be used by eastbound freight trains.

Change of line and reduction of grade between Blaser and West End, about 4 miles, including construction of new double track tunnel, about 4,250 feet in length, between Tunnelton and West End. The existing Kingwood Tunnel, operated in conjunction with this new line, will give three tracks and afford necessary relief where the traffic heretofore has been restricted by the single track gauntlet through Kingwood Tunnel.

Construction of third track, West End to Hardman, 6 miles, including an open cut for three tracks, in place of "Murray's Tunnel," which will permit use of Mallet engines now prevented by tunnel clearances.

Extension of third track between Foley and Mance and Sand Patch and Keystone, approximately 5 miles, to aid movement on Sand Patch grade.

Extension of second track and additional passing sidings between Rockwood and Somerset, required by increased traffic on Somerset & Cambria Branch.

Extension of Quemahoning Branch R. R., 9 miles, from Jenner to connection with the Somerset & Cambria Branch at Somerset, to care for coal traffic offered by operations in this field. The line also develops additional coal territory.

Construction of second track in open cut, including elimination of single-track gauntlet, 1,500 feet, through tunnel at Bakerstown, Pa., thereby making second track continuous from Sand Patch Tunnel to Hamler, on the Chicago Division.

Extensions of second tracks with grade revisions, additional passing sidings and yard tracks between Wheeling and Lorain, to meet requirements in handling the heavy business on this portion of the line during the lake season.

Construction of 21 miles of second track between Wellsboro and McCools, on the Chicago Division, necessary on account of existing traffic. With the completion of this work there will remain only 86 miles of single track on the Chicago Division.

Additions and Extension of Yards and Terminal Facilities.

Brunswick, Md.—New roundhouse, extension of engine tracks and engine pits to handle additional power now required on this division.

Grafton, W. Va.—Extension of terminal, including new receiving and forwarding yards, necessary for the present business and to provide for increase.

Tunnel, W. Va.—New receiving and forwarding yard, with small engine house, Wye; engine tracks and ash pits necessary in conjunction with new Lumberport connection, to relieve the Wheeling Division of part of the westbound business from Fairmont Region.

Benwood, W. Va.—New roundhouse, with requisite tracks, water supply and power plant to replace facilities which had become inadequate on account of increase in size of power.

Somerset, Pa.—Receiving and forwarding yards, with scales, small engine house, turntable, ash pits, engine track, etc., to facilitate the classifying and weighing of coal from the Somerset Region.

Lorain, Ohio.—Additional storage yard for 500 cars and reconstruction and additions to the ore handling facilities at this port.

Chicago Junction, Ohio.—New eastbound and westbound yards, where existing facilities were inadequate for the increased business.

The Renewal of Bridges and Elimination of Grade Crossings.

Progress was made during the year on the general plan for the renewal and strengthening of such bridges as are not of sufficient capacity to carry the heaviest locomotives. The bridges on the line from Philadelphia to Grafton and on the Pittsburgh and Chicago Divisions will be completed in 1910; remainder of program will be carried out as promptly as conditions permit. This plan makes possible the use of the heaviest power where needed and the handling of maximum loads.

Work has begun on elimination of grade crossings in the cities of Baltimore, Md.; Columbus, Ohio, and Chicago, Ill. That at Baltimore and Chicago will extend over a period of years; that at Columbus will be finished during the following fiscal year.

The aggregate expenditures for construction and betterments for the twelve months have been $5,549,819.56, which, in accordance with the classification prescribed by the Interstate Commerce Commission, has been charged to "Property Investment, Road."

EQUIPMENT.

Rolling Equipment.

The equipment of the entire system is shown in table 14 of this report.

The book value of all equipment at June 30, 1909, was.....		$70,849,029.40
During the year there was added to the equipment the following:		
166 locomotives, 44 passenger cars, 7,023 freight cars, 2 work cars, at a cost of		8,963,819.78
The title to 163 locomotives and 7,000 freight cars is in the Baltimore & Ohio Equipment Company		
		$79,812,849.18
During the year the following equipment was put out of service through condemnation, wreck, fire and sale, viz.: 17 locomotives, 17 passenger cars, 3,892 freight cars, 304 work cars, having a book value of.....	$876,596.92	
which amount was charged to operating expenses (less salvage charged to material account) and credited to capital account equipment.		
There was charged to operating expenses and credited to reserve for accrued depreciation.. representing depreciation for fiscal year of equipment owned.	$1,931,401.41	
During the year a Committee of Officers of the Operating, Mechanical and Accounting Departments, appointed to appraise the rolling equipment of the company, reported the book value at June 30, 1909, as higher than the appraised value by $8,516,160.35.		
On recommendation of the executive officers and approval of the board, this amount was charged to appropriated surplus and accounts credited, viz.:		
To capital account equipment.....	$7,141,713.28	
To reserve for accrued depreciation	$1,374,447.07	
		8,018,310.20
Making book value of rolling equipment at June 30, 1910		$71,794,538.98

Marine Equipment.

The book value of all equipment at June 30, 1909, was.....		$1,110,076.49
During the year there was added to the equipment the following: 1 tug boat, 2 car floats, 1 launch, at a cost of		49,201.81
		$1,159,278.30
Sale was made of the tug boat "Cyclops," having a book value of		6,992.10
which amount was charged to operating expenses (less salvage from sale) and credited to capital account equipment,		
Making book value of marine equipment at June 30, 1910....		$1,152,286.20

Summary.

Value of rolling equipment, June 30, 1910.....	$71,794,538.98
Value of floating equipment, June 30, 1910.....	1,152,286.20
Total book value	$72,946,825.18
Less reserve for accrued depreciation—Cr. (Equipment)....	6,048,981.51
Net value of equipment.....	$66,897,843.67

CHICAGO TERMINAL.

Negotiations were concluded during the year whereby your company secures its own entrance into Chicago and the freight and passenger facilities it has occupied there under lease for a number of years. The ownership is through the Baltimore & Ohio Chicago Terminal Railroad Company, all the stock of which is owned by your company, the former having purchased at foreclosure sale January 6, 1910, all of the property and fran-

chises formerly owned by the Chicago Terminal Transfer Railroad Company, which consist of passenger and freight terminal facilities and other properties in the city of Chicago, and approximately 101 miles of railway lines, 84 of which are owned and the remainder held under permanent lease.

The Baltimore & Ohio Chicago Terminal Railroad Company has made a mortgage, dated April 1, 1910, to secure an authorized issue of $50,000,000 first mortgage 4 per cent. bonds, due April 1, 1960, and guaranteed by your company. Of the $33,000,000 of these bonds immediately issuable, your company has acquired $28,000,000, the remainder being held in the treasury of the terminal company.

INSURANCE FUND.

A summary of the operations for the year ended June 30, 1910, and a statement of the assets and liabilities, as compared with previous year, are shown in table 6.

RELIEF DEPARTMENT.

The report of the Relief Department for the twelve months ended June 30, 1910, will be printed, as customary, for distribution to members. The operations of the department, covering the relief, savings and pension features, will be found in table 7 of this report.

OFFICIAL CHANGES.

Mr. D. B. Martin, manager of passenger traffic since 1897, having died October 12, 1909, the position was abolished and that of general traffic manager, covering both passenger and freight traffic, created. Mr. C. S. Wight, formerly manager of freight traffic, being appointed thereto, effective November 1, 1909.

Mr. H. D. Bulkley, connected with the service since 1888 and its comptroller since 1892, having died on November 25, 1909, Mr. George W. Booth, formerly assistant comptroller, was appointed comptroller, effective December 1, 1909.

Effective January 15, 1910, the position of chairman of the board having been created, Mr. Oscar G. Murray was elected thereto.

Mr. Daniel Willard was elected president, vice Mr. Oscar G. Murray, resigned.

Effective April 1, 1910, the Northwest District was created, including the lines west of Chicago Junction, Ohio, and Mr. F. C. Batchelder, formerly general superintendent of the Main Line District, was appointed general superintendent thereof.

Mr. F. E. Blaser, formerly superintendent of the Cumberland Division, was appointed general superintendent of the Main Line District, vice Mr. F. C. Batchelder, promoted.

Effective April 11, 1910, Mr. A. M. Kinsman, having requested that he be relieved of the duties of chief engineer, was appointed consulting engineer.

Mr. A. W. Thompson, formerly chief engineer maintenance of way, was appointed chief engineer, vice Mr. A. M. Kinsman, transferred.

Mr. Earl Stimson, formerly engineer maintenance of way, Southwestern District, was appointed chief engineer maintenance of way, vice Mr. A. W. Thompson, promoted.

Effective April 15, 1910, the position of Western freight traffic manager having been created, Mr. O. A. Constans, formerly general freight agent, Pittsburgh, Pa., was appointed thereto.

Mr. D. G. Gray, formerly division freight agent, Pittsburgh, Pa., was appointed general freight agent, Pittsburgh, Pa., vice Mr. O. A. Constans, promoted.

Effective May 1, 1910, Mr. H. B. Voorhees, formerly superintendent of the Philadelphia Division, was appointed an additional assistant to the president.

Mr. Robert Finney, formerly general superintendent of the Pittsburgh District, was appointed general agent at Pittsburgh, Pa.

Mr. W. C. Loree, formerly general superintendent of the Wheeling District, was appointed general superintendent of the Pittsburgh District, vice Mr. Robert Finney, transferred.

Mr. U. B. Williams, formerly superintendent of the Monongah Division, was appointed general superintendent of the Wheeling District, vice Mr. W. C. Loree, transferred.

Effective May 10, 1910, Mr. J. T. Carroll was appointed superintendent of motive power, Pittsburgh District.

Effective June 1, 1910, Mr. H. L. Bond, Jr., second vice-president and general counsel, was, at his own request, relieved of the office of second vice-president.

Effective July 1, 1910, Mr. George H. Campbell, formerly general superintendent of the New York Division, was appointed an additional assistant to the president.

Mr. John G. Walber, formerly general superintendent of transportation, was appointed assistant general manager.

Mr. C. W. Galloway, formerly superintendent of transportation, was appointed general superintendent of transportation, vice Mr. John G. Walber, promoted.

Mr. C. C. F. Bent, formerly general manager of the Baltimore & Ohio Southwestern, was appointed general superintendent, New York Division vice Mr. George H. Campbell, promoted.

The president and directors take pleasure in acknowledging the faithful and efficient services of the officers and employes during the past year.

By order of the board,

DANIEL WILLARD,
President.

GENERAL BALANCE SHEET—YEAR ENDED JUNE 30, 1910.

ASSETS.

Property investments:		
Road and equipment—		
Investment to June 30, 1907—		
Road	$203,192,086.29	
Equipment	62,942,416.61	$266,134,502.90
Investment since June 30, 1907—		
Road	$11,033,358.36	
Equipment	10,004,408.57	
General expenditures	29,746.94	21,067,513.87
		$287,202,016.77
Reserve for accrued depreciation—Cr. (Equipment)		6,048,981.51
Total		$281,153,035.26
Securities—		
Securities of proprietary, affiliated and controlled companies—pledged—		
Stocks	$43,122,870.20	
Funded debt	126,740,878.87	
Miscellaneous	5,905,583.01	$175,769,332.08
Securities of proprietary, affiliated and controlled companies—unpledged—		
Stocks	$7,984,352.47	
Funded debt	1,330,024.21	9,314,376.68
Total		$185,083,708.76
Other investments—		
Miscellaneous investments—		
Physical property	$3,790,645.34	
Securities pledged	46,673,284.00	
Securities unpledged	3,477,472.44	$53,941,401.78
Total		$53,941,401.78
Total property and other investments		$520,178,145.80
Working assets:		
Cash		$11,755,951.34
Securities issued or assumed held in treasury—(Book Value).		
Stocks	$1,226,346.09	
Funded debt	6,192,939.77	7,419,285.86
Marketable securities—		
Stocks	$896,121.49	
Funded debt	867,468.64	1,763,590.13
Loans and bills receivable		39,629,892.89
Traffic and car service balances due from other companies		402,951.31
Net balance due from agents and conductors		2,575,896.52
Miscellaneous accounts receivable		8,871,782.06
Materials and supplies		7,526,259.81
Total		$79,945,609.92
Deferred debit items:		
Advances—		
Working funds	$169,465.30	
Other advances	60,000.00	$229,465.30
Cash and securities in sinking and redemption funds		286,000.32
Cash and securities in insurance and other reserve funds		1,075,472.59
Cash and securities in provident funds		99,167.20
Other deferred debit items		379,274.71
Total		$2,069,380.12
Grand total		$602,193,135.84

LIABILITIES.

Stock:			
Capital stock—			
Common stock..	Held by company	$236,401.16	
	Not held by company	151,912,442.20	
		$152,148,843.36	
Preferred stock..	Held by company	$1,108,695.30	
	Not held by company	58,875,258.70	
		$59,983,954.00	$212,132,797.36
Stock liability for conversion of outstanding securities of constituent companies			86,990.61
Total			$212,219,787.97
Mortgage, bonded and secured debt:			
Funded debt—			
Mortgage bonds.	Held by company	$1,144,650.00	
	Not held by company	228,921,430.00	
		$230,066,080.00	
Collateral trust Bonds	Held by company	$5,048,360.00	
	Not held by company	44,951,640.00	
		$50,000,000.00	
Plain bonds, debentures and notes	Held by company	.....	
	Not held by company	$40,098,000.00	
		$40,098,000.00	
Miscellaneous funded obligations	Held by company	.....	
	Not held by company	$1,145,057.06	
		$1,145,057.06	$321,309,137.06
Total			$321,309,137.06
Total capital liabilities			$533,528,925.03
Working liabilities:			
Loans and bills payable			$10,000,000.00
Traffic and car-service balances due to other companies			365,769.08
Audited vouchers and wages unpaid			6,212,343.62
Miscellaneous accounts payable			912,983.43
Matured interests, dividends and rents unpaid			180,437.36
Working advances due to other companies			2,437,637.00
Total			$20,109,170.49
Accrued liabilities not due:			
Unmatured interest, dividends and rents payable			$9,773,858.65
Total			$9,773,858.65
Deferred credit items:			
Liability on account of provident funds			$1,287,013.66
Other deferred credit items			790,387.54
Total			$2,077,401.20
Appropriated surplus:			
Additions to property through income	Prior to June 30, 1907		$10,965,168.91
	Since June 30, 1907		1,286,038.64
Reserves from income or surplus—			
Invested in other reserve funds			1,075,472.59
Total			$13,326,680.14
Profit and loss:			
Balance			$23,377,100.33
Grand total			$602,193,135.84

The above general balance sheet presents an accurate statement of the accounts of the company, as of June 30, 1910.

G. W. BOOTH, Comptroller.

FREIGHT TRAFFIC STATISTICS.

(Company's freight not included.)

THE BALTIMORE & OHIO RAILROAD SYSTEM.

ALL COMMODITIES. (Including Soft Coal.)	1910.	Compared with 1909. Increase.	Decrease.
Miles of road	4,434.39	.....	25.51
Freight earnings	$69,408,112.68	$11,058,000.85	.....
Per cent. of total earnings	78.07	1.70	.....
Number of tons carried	62,797,745	11,587,584	.....
Number of tons carried one mile	12,024,583,527	1,975,302,682	.....
Average miles each ton was carried	191.48	.....	4.76
Number of tons carried per mile of road	14,162	2,680	.....
Number of tons carried one mile per mile of road	2,711,666	458,413	.....
Freight earnings per mile of road	$15,652.23	$2,567.83	.....
Average earnings per ton (cents)	110.53	.....	3.42
Average earnings per ton per mile (cents)	0.577	.....	0.004
Average number of tons loaded in car	22.89	.50	.....
Average train load (tons)	442.37	14.32	.....
Average number loaded cars in train	19.32	.20	.....
Average number empty cars in train	9.02	.....	.83
Revenue freight train mil'ge	27,182,329	3,705,251	.....
Revenue freight train mileage per mile of road	6,130	866	.....
Freight earnings per revenue freight train mile (cents)	255.34	6.78	.....
SOFT COAL.			
Number of tons carried	26,970,689	4,260,866	.....
Number of tons carried one mile	5,399,029,054	770,917,871	.....
Average miles each ton was carried	200.18	.....	3.61
Ave'ge earnings per ton (cts.)	82.15	.....	2.36
Average earnings per ton per mile (cents)	.410	.....	.005

NOTE—Figures for 1909 recast, for purpose of comparison, to include Affiliated and Controlled Lines.

PASSENGER TRAFFIC STATISTICS.

THE BALTIMORE & OHIO RAILROAD SYSTEM.

	1910.	Compared with 1909. Increase.	Decrease.
Miles of road	4,434.39	.....	25.51
Passenger earnings	$14,485,585.09	$934,346.81	.....
Per cent. of total earnings	16.29	.....	1.44
Number of passengers carried	21,107,120	1,210,568	.....
Number of passengers carried one mile	763,448,759	42,690,027	.....
Average miles each passenger was carried	36.17	.....	.06
Number of passengers carried per mile of road	4,760	299.	.....
Number of passengers carried one mile per mile of road.	172,165	10,556	.....
Passenger earnings per mile of road	$3,266.65	$228.19	.....
Average earnings from each passenger (cents)	68.63	.52	.....
Average earnings per passenger per mile (cents)	1.897	.017	.....
Average number of passengers per train	47	1	.....
Passenger train mileage (excluding special express trains)	15,291,913	132,491	.....
Passenger train mileage per mile of road (excluding special express trains)	3,448	49	.....
Passenger earnings per train mile (cents)	94.73	5.34	.....
Passenger train mileage (including special express trains)	16,151,340	330,170	.....
Passenger train mileage per mile of road (including special express trains)	3,642	95	.....
Passenger train earnings—all sources	$17,872,589.44	$1,066,284.49	.....
Passenger train earnings per mile of road—all sources	$4,030.45	$262.14	.....
Passenger train earnings per train per mile—all sources (cents)	110.66	4.43	.....

NOTE—Figures for 1909 recast, for purpose of comparison, to include Affiliated and Controlled Lines.

THIRTIETH ANNUAL REPORT.—THE CHICAGO, ROCK ISLAND & PACIFIC RAILWAY COMPANY.

Fiscal year ended June 30, 1910.

To the Stockholders:

The Board of Directors herewith submit their report of the operations and affairs of the Rock Island Lines for the fiscal year ended June 30, 1910.

The results of the operations for the year were as follows:

Total operating revenue (increase $5,035,691.99, or 8.2 per cent.)	$66,220,578.94	
Operating expenses (increase $5,555,873.50, or 13.1 per cent.)	48,069,368.91	
Net operating revenue (decrease $520,181.51, or 2.8 per cent.)		$18,151,210.03
Taxes (increase $605,836.12, or 26.7 per cent.)		2,876,700.67
Operating income		$15,274,509.36
Miscellaneous income		223,231.82
Total income		$15,497,741.18
Interest and rentals		10,749,860.10
Balance of income, after providing for all charges, being 6.3 per cent. on capital stock ($75,000,000.00)		$4,747,881.08
Dividends paid (5 per cent. on capital stock)		3,743,272.00
Balance surplus for the year (decrease $1,231,602.91, or 55.1 per cent.)		$1,004,609.08

CAPITAL STOCK.

The capital stock of the company outstanding at the close of the previous fiscal year was $74,859,600.00, and has since been increased by the issue of $17,600.00 in exchange for $17,100.00 capital stock of the Burlington, Cedar Rapids and Northern Railway Company and $500.00 capital stock of the Rock Island & Peoria Railway Company, making the total amount of capital stock outstanding at June 30, 1910, $74,877,200.00.

FUNDED DEBT.

During the year the funded debt, not including equipment notes, increased $15,682,000.00, and equipment notes increased $10,795,000.00, making an increase in total funded debt of $26,477,000.00.

ROAD AND EQUIPMENT.

The cost of the "Investment since June 30, 1907" increased $19,152,201.80 during the past year, which figure includes the value of new equipment purchased under trusts or otherwise acquired, and $3,311,942.84 for additions and betterments.

NEW LINES CONSTRUCTED.

The line between Amarillo, Tex., and Tucumcari, N. M., heretofore shown as under construction, has been completed through to Tucumcari, N. M., where it joins your main line to the Southwest, making the shortest line between Memphis, Tenn., and southern California, via New Mexico and Arizona; 6.71 miles were placed in operation on August 10, 1909, and the remaining 64 miles were completed and placed in operation on May 9, 1910. The line is laid with 60, 65 and 70-pound steel rail on white oak ties. Standard station buildings have been erected at Vega, Adrian and Glenrio, Tex., and at Endee and San Jon, N. M. The distance via the new line thus opened from Memphis, Tenn., to Tucumcari, N. M., is 873.72 miles. The completion of this line made the use by this company of the Fort Worth & Denver City Railway from Amarillo, Tex., to Dalhart, Tex., 82.06 miles, unnecessary; the trackage rights were therefore relinquished May 9, 1910.

NEW EQUIPMENT.

Orders have been placed during the year for 184 locomotives, 5 passenger motor cars, 81 steel passenger train cars (including 10 horse cars), 7,550 freight train cars and 7 service cars, of which 50 locomotives, 1 passenger motor car and 3,550 freight train cars were mentioned in last year's report; 4 switch locomotives and 1 service car were also ordered built at the company's shops. There were received and placed in service 86 locomotives, 97 steel passenger train cars, 3 passenger motor cars, 3,741 freight train cars and 6 service cars. There are to be delivered between June 30 and December 31, 1910, 104 locomotives, 73 steel passenger train cars, 10 horse cars, 2 passenger motor cars, 3,869 freight train cars and 2 service cars, except that 4 mail cars are due in February, 1911.

GENERAL.

There were located along the Rock Island Lines during the fiscal year, according to the records of the industrial department, 193 new industries, estimated to have cost nearly $15,000,000, to employ over 8,700 men and to create an annual movement of 53,000 carloads of revenue freight.

Changes in industrial side tracks are as follows: Eleven built to coal mines and 88 to private industries, also two mine tracks and 33 tracks to other industries were extended.

During the year automatic block signals were installed and placed in operation from Muscatine, Ia., to Eldon, Ia.; from St. Joseph, Mo., to Rushville, Mo.; from Iowa City, Ia., to Neola, Ia.; from West Liberty, Ia., to Linn Junction, Ia., and from Irving, Tex., to Dallas, Tex.—388.2 miles. The expenditure during the year for the construction of these signals was $430,795.55. The total expenditure to June 30, 1910, for the construction of block signals was $968,192.22, which figures include the cost of 734.4 miles completed and placed in operation and 233.5 miles under construction.

The telephone system of train dispatching was installed during the year on 1,146.3 miles of road, and at June 30, 1910, the telephone system was in use on 1,602.1 miles of your railroad, representing a total expenditure of $162,557.16, which figures include the entire cost of the poles, wire, etc., on the new line from Amarillo, Tex., to Tucumcari, N. M.

During the year the expenditures for maintenance of your property have been larger than for preceding years. Attention is invited to detailed information concerning expenditures for ties, rails, ballast, bridges, etc., shown herewith.

Your company expended $933,042.05 during the year for construction of additional and improved terminal facilities. These figures cover new facilities and the completion of those previously reported.

Attention is called to the continued increase in taxes, amounting to $605,836.12, or 26.68 per cent., as compared with an increase of $480,969.76, or 26.87 per cent., last year; making 1910 taxes $1,086,805.88 higher than those of 1908, an increase of 60.72 per cent. Of this year's increase $113,992.42 is on account of the new Federal excise tax on net income; the remainder consists of increases in taxes in various States, only a small portion of which is occasioned by the construction of new lines.

Your company advanced during the year toward the construction, equipment and operating deficit of the Trinity & Brazos Valley Railway $403,351.86, making the total advances to June 30, 1910, $2,339,992.72, of which $697,247.69 was reimbursed out of the proceeds of bonds of the Colorado & Southern Railway Company, leaving $1,642,745.03 outstanding advances.

Advances during the year for Houston, Tex., terminals were $147,883.83, making the total advances to June 30, 1910, $450,985.96. First mortgage bonds of the Houston Belt & Terminal Railway Company were received in settlement of $277,669.55, leaving $173,316.41 outstanding advances.

On January 1, 1910, there was placed in effect a pension system, which provides that employees, who after long years of faithful service have reached an age when they are unequal to the performance of their duties, will be retired and receive from your company monthly incomes during the remainder of their lives, based on their salary for the last ten years next preceding retirement and the entire length of continuous service with your company. By this pension system your company hopes to build up among its employees a feeling of permanency in their employment and interest in the company's welfare and a desire to remain in and devote their best efforts to the company's service. The total cost to your company for pensions paid and the expense of administration of the system for the six months ended June 30, 1910, has been $12,037.64, and it is estimated that this system will cost approximately $30,000 during the ensuing fiscal year.

As announced in last year's report, because of the supervision of your company's accounts by the Interstate Commerce Commission, it is considered unnecessary to procure the certification of these accounts by an independent auditor.

October 24, 1910. By order of the Board of Directors,

H. U. MUDGE,
President.

ROCK ISLAND LINES

CONDENSED GENERAL BALANCE SHEET—JUNE 30, 1910, AND COMPARISON WITH PREVIOUS YEAR.

Assets	1910	1909	Increase or Decrease
Property investment:			
Road and equipment:			
Investment to June 30, 1907	$255,585,343.24	$255,585,343.24	
Investment since June 30, 1907	25,704,459.09	6,552,257.29	$19,152,201.80
Reserve for accrued depreciation—credit	338,009.84	223,108.34	*114,901.50
Total road and equipment	$280,951,792.49	$261,914,492.19	$19,037,300.30
Securities:			
Securities of proprietary, affiliated and controlled companies—pledged (carried at nominal value)	3.00	2,002.00	*$1,999.00
Securities of proprietary, affiliated and controlled companies—unpledged	9,019,834.25	9,596,479.53	*576,645.28
Other investments:			
Advances to proprietary, affiliated and controlled companies for construction, equipment and betterments	5,511,717.39	4,868,809.14	642,908.25
Miscellaneous investments	1,739,696.55	2,066,152.87	*326,456.32
Total property investment	$297,223,043.68	$278,447,935.73	$18,775,107.95
Working assets:			
Cash	$4,541,460.59	$3,851,068.00	$690,392.59
Securities issued or assumed—held in treasury	4,227.50	1,373.17	2,854.33
Marketable securities	17,081,146.72	12,382,882.86	4,698,263.86
Loans and bills receivable	596,515.44	1,018,349.05	*421,833.61
Traffic and car-service balances due from other companies	299,506.92	260,751.59	38,755.33
Net balance due from agents and conductors	1,142,880.35	992,598.61	150,281.74
Miscellaneous accounts receivable	2,889,530.25	2,222,866.20	666,664.05
Materials and supplies	6,224,132.74	5,703,346.81	520,785.93
Other working assets	1,540,956.20	1,244,593.56	296,362.64
Total working assets	$34,320,356.71	$27,677,829.85	$6,642,526.86
Accrued income not due:			
Unmatured interest, dividends and rents receivable	$392,302.46	$233,323.16	$158,979.30
Deferred debit items:			
Advances	$1,534,707.44	$1,632,990.44	*$98,283.00
Rents and insurance paid in advance	151,382.30	147,915.23	3,467.07
Special deposits (see note)	7,798,005.43	50,784.76	7,747,320.67
Other deferred debit items	1,433,345.22	785,861.26	647,483.96
Total deferred debit items	$10,917,440.39	$2,617,551.69	$8,299,888.70
Grand total	$342,853,143.24	$308,976,640.43	$33,876,502.81

Liabilities	1910	1909	Increase or Decrease
Stock:			
Capital stock	$75,000,000.00	$75,000,000.00	
Mortgage, bonded and secured debt:			
Funded debt	228,002,000.00	201,525,000.00	$26,477,000.00
Total capital liabilities	$303,002,000.00	$276,525,000.00	$26,477,000.00
Working liabilities:			
Loans and bills payable		$1,590,000.00	*$1,590,000.00
Traffic and car-service balances due to other companies	$795,878.70	841,669.54	*45,790.84
Audited vouchers and wages unpaid	5,254,493.94	4,557,654.52	696,839.42
Miscellaneous accounts payable	323,070.38	241,183.36	81,887.02
Matured interest, dividends and rents unpaid	2,683,910.84	2,683,607.07	303.77
Matured mortgage, bonded and secured debt unpaid	23,000.00	3,000.00	20,000.00
Working advances due to other companies	189,799.69	188,501.40	1,298.29
Other working liabilities	735,643.55	684,425.64	51,217.91
Total working liabilities	$10,005,797.10	$10,790,041.53	*$784,244.43
Accrued liabilities not due:			
Unmatured interest, dividends and rents payable	$1,808,001.10	$1,567,647.21	$240,353.89
Taxes accrued	1,354,229.48	1,024,399.04	329,830.44
Total accrued liabilities not due	$3,162,230.58	$2,592,046.25	$570,184.33
Deferred credit items:			
Operating reserves	$1,193,907.38	$852,115.02	$341,792.36
Other deferred credit items (see note below)	8,132,024.86	385,809.36	7,746,215.50
Total deferred credit items	$9,325,932.24	$1,237,924.38	$8,088,007.86
Grand total liabilities	$325,495,959.92	$291,145,012.16	$34,350,947.76
Appropriated surplus			
Additions to property since June 30, 1907, through income	64,367.76	64,367.76	
Profit and loss:			
Balance	17,292,815.56	17,767,260.51	*474,444.95
Grand total	$342,853,143.24	$308,976,640.43	$33,876,502.81

* Decrease.

Note.—1910 figures include $7,637,573.99 contract consideration for new trust equipment not delivered. Cash is on deposit with trustees and is included in "Special deposits" under "Deferred debit items."

Note.—In stating the assets and liabilities of the companies forming the Rock Island Lines, the holdings of The Chicago, Rock Island and Pacific Railway Company in the bonds and capital stock of the auxiliary lines together with loans between the various companies, have been eliminated from the liabilities and a like reduction made in the assets pertaining thereto; the figures shown, therefore, represent the book value of the assets and the liabilities without duplication.

INCOME ACCOUNT
YEAR ENDED JUNE 30, 1910, COMPARED WITH PREVIOUS YEAR

	1909-10	1908-09	Increase or Decrease Amount	Pr. Ct.
Average mileage operated	8,043.59	8,026.38	17.21	.21
Revenue from transportation:				
Freight	$42,218,880.84	$39,158,053.16	$3,060,827.68	7.82
Passenger	19,378,174.27	17,883,378.99	1,494,795.28	8.36
Mail	1,448,435.51	1,429,829.62	18,605.89	1.30
Express	1,927,245.61	1,626,931.53	300,314.08	18.46
Miscellaneous	774,380.24	720,280.57	54,099.67	7.51
Total transportation revenue	$65,747,116.47	$60,818,473.87	$4,928,642.60	8.10
Revenue from operations other than transportation	473,462.47	366,413.08	107,049.39	29.22
Total operating revenue	$66,220,578.94	$61,184,886.95	$5,035,691.99	8.23
Operating expenses:				
Maintenance of way and structures	$10,673,387.02	$9,051,830.36	$1,621,556.66	17.91
Maintenance of equipment	8,455,745.72	7,512,888.55	942,857.17	12.55
Traffic expenses	1,795,262.39	1,441,214.58	354,047.81	24.57
Transportation expenses	25,195,578.74	22,848,052.39	2,347,526.35	10.27
General expenses	1,949,395.04	1,659,509.53	289,885.51	17.47
Total operating expenses	$48,069,368.91	$42,513,495.41	$5,555,873.50	13.07
Net operating revenue	$18,151,210.03	$18,671,391.54	*$520,181.51	2.79
Taxes	2,876,700.67	2,270,864.55	605,836.12	26.68
Operating income	$15,274,509.36	$16,400,526.00	*$1,126,017.63	6.87
Outside operations (debit balance)	$155,891.29	$146,201.11	*$9,690.18	6.63
Hire of equipment (debit balance)	1,171,066.25	812,116.05	*358,950.20	44.20
Other income	1,550,189.36	1,169,788.05	380,401.31	32.52
Total	$223,231.82	$211,470.89	$11,760.93	5.56
Total income	$15,497,741.18	$16,611,997.88	*$1,114,256.70	6.71
Interest	$9,129,874.61	$8,861,223.05	$268,651.56	3.03
Rentals	1,547,402.01	1,567,966.93	*20,564.92	1.31
Betterments on leased lines	72,583.48	16,577.16	56,006.32	337.85
Total charges	$10,749,860.10	$10,445,767.14	$304,092.96	2.91
Balance of income (available for dividends)	$4,747,881.08	$6,166,230.74	*$1,418,349.66	23.00
Dividends	3,743,272.00	3,930,018.75	*186,746.75	4.75
Balance surplus (carried to credit of profit and loss)	$1,004,609.08	$2,236,211.99	*$1,231,602.91	55.08

* Decrease.

Dividends Declared During Year Ended June 30, 1910:

Dividend No. 117, 1¾	per cent. paid October, 1909	$1,310,006.25
Dividend No. 118, 1	per cent. paid January, 1910	748,575.00
Dividend No. 119, 1¼	per cent. paid April, 1910	935,938.75
Dividend No. 120, 1	per cent. paid July, 1910	748,752.00
Total, 5	per cent.	$3,743,272.00

PROFIT AND LOSS

Credit balance, June 30, 1909				$17,767,260.51
Surplus for year ended June 30, 1910			$1,004,609.08	
Interest prior to current fiscal year on advances for construction			171,912.62	
Sundry adjustments not affecting current year's income			25,976.95	
			$1,202,498.65	
Less:				
Discount on bonds issued and sold, commission and premium on loan made, and loss on lands sold		$996,710.74		
Depreciation on:				
Tracks removed	$59,439.00			
Structures sold, removed or destroyed	93,131.24			
Equipment sold, dismantled or destroyed	527,662.62	680,232.86	1,676,943.60	*474,444.95*
Credit balance, June 30, 1910				$17,292,815.56

EXPENDITURES FOR ADDITIONS AND BETTERMENTS
YEAR ENDED JUNE 30, 1910

Right of way and station grounds	$154,434.78	
Widening cuts and fills	192,919.03	
Protection of banks	12,179.10	
Grade revisions and changes of line	16,914.71	
Bridges, trestles and culverts	149,652.45	
Increased weight of rail	197,252.08	
Improved frogs and switches	9,515.97	
Track fastenings and other materials	48,513.31	
Ballast	495,641.24	
Additional main tracks	1,499.43	
Sidings and spur tracks	307,769.13	
Terminal yards	146,117.06	
Fencing right of way	20,483.79	
Improvement of over and under grade crossings	2,847.14	
Track elevation, elimination of grade crossings, etc.	73,851.42	
Interlocking apparatus	37,645.23	
Block and other signal apparatus	457,710.62	
Telegraph and telephone lines	124,120.98	
Station buildings and fixtures	346,490.62	
Shops, engine houses and turn tables	167,359.47	
Shop machinery and tools	36,261.87	
Water and fuel stations	223,606.18	
Grain elevators and storage warehouses	37,660.50	
Dock and wharf property	20.35	
Electric light and power plants	2,687.60	
Miscellaneous structures	416.22	
Interest and commissions	51,371.42	$3,311,942.84
Equipment:		
Steam locomotives	$89,515.82	
Passenger train cars	29,630.78	
Freight train cars	4,513.43	
Work equipment	12,982.26	136,642.29
Total additions and betterments		$3,448,585.13

Figures in *italics* denote credits.

ROCK ISLAND LINES. MAINTENANCE OF WAY AND STRUCTURES—REMARKS.

YEAR ENDED JUNE 30, 1910.

The following is a comparative statement of miles of the first track main lines (as distinguished from branch lines) owned or leased, not including trackage rights, which are used in the rail and ballast tables on preceding page:

	June 30. 1910.	1909.
Chicago, Ill., to Colorado Springs, Colo	1,063.03	1,063.92
Davenport, Ia., to Dallas, Tex. (via Kansas City)	833.61	833.57
Herington, Kan., to Santa Rosa, N. M.	526.92	526.59
Burlington, Ia., to Minneapolis, Minn	307.58	307.58
Altamont, Mo., to Nor. Topeka, Kan. (via St. Joseph)	137.96	138.09
McFarland, Kan., to Belleville, Kan	103.19	103.19
Memphis, Tenn., to Tucumcari, N. M. (to six miles west of Ontario, Tex., in 1909)	869.87	799.16
Biddle, Ark., to Eunice, La	292.40	292.52
St. Louis, Mo., to Kansas City, Mo	283.90	283.97
Total	4,418.46	4,348.59

Improvements to roadway have been made as follows:

Ties were renewed to the extent of 2,602,978 or an average of 343 per mile of first, second and third main track owned and leased; of these ties 2,200,278 were treated with creosote.

Track miles of new ballast	184.30 miles
Track miles reballasted	281.71 miles
Miles of roadbed widened to standard width	212.58 miles
Road miles of new right of way fence built	26.94 miles
Lineal feet, transversely to track, of iron pipe culverts built	3,920 feet
Lineal feet, transversely to track, of iron pipe culverts built	6,180 feet
Lineal feet, transversely to track, of vitrified pipe culverts built	794 feet
Lineal feet of timber bridges or trestles replaced with steel, concrete or masonry bridges	360 feet
Lineal feet of bridges and trestles filled	9,475 feet
Lineal feet of iron or steel bridges replaced with heavier structures	1,220 feet
Lineal feet of new pile trestles built	1,581 feet
Lineal feet of new steel bridges built	141 feet

The following table shows the aggregate length and nature of bridges for June 30, 1910, compared with previous year:

		Kind of bridge and length (in feet)				
Bridges.	Total (feet)	Steel and iron	Masonry	Combination (wood and iron)	Wooden	Trestles
Main track, June 30, 1910	521,879	147,616	620	3,093	2,449	368,101
Per cent. of total length	.....	28.29	.12	.59	.47	70.53
Main track, June 30, 1909	527,403	146,571	566	4,052	2,570	373,644
Per cent. of total length	.....	27.79	.11	.77	.49	70.84

The average expense of maintenance of way and structures per mile of first, second and third main track owned and leased during the past fiscal year was $1,372.85, as against $1,145.58 last year.

All the rail relaid during the year has replaced lighter weight and a corresponding increase in metal has been made in appliances.

MAINTENANCE OF WAY AND STRUCTURES—REMARKS
YEAR ENDED JUNE 30, 1910

COMPARATIVE STATEMENTS OF RAIL IN MAIN AND BRANCH LINES OWNED OR LEASED AS OF JUNE 30, 1909, AND 1910.

OF JUNE 30, 1909 AND 1910

	Rail	Total Miles Owned or Leased	Weight Per Yard and Miles of Each Weight							
			100	85	80	Re-rolled 80	70	65-6-7-8	60	56-8	52 and under
	Main Lines:										
1910	First track	*4,418.46	5.20	1,089.46	2,022.17	208.50	69.16	665.48	349.26	9.23	.....
	Second track	267.31		148.85	118.46	.....	.....	.....	.....	.....	.....
	Third track	9.43	.....	.....	.....	.....	9.43	.....	.....	.....	.....
	Total	4,695.20	5.20	1,238.31	2,140.63	208.50	78.59	665.48	349.26	9.23	.....
	Per cent. of main lines	.....	.11	26.38	45.59	4.44	1.67	14.17	7.44	.20	.....
1909	First track	*4,348.59	5.20	870.60	2,103.24	129.69	131.90	700.52	394.06	13.38	.....
	Second track	265.02	.....	103.32	161.70	.....	.....	.....	.....	.....	.....
	Third track	9.43	.....	.....	.....	.....	9.43	.....	.....	.....	.....
	Total	4,623.04	5.20	973.92	2,264.94	129.69	141.33	700.52	394.06	13.38	.....
	Per cent of main lines	.....	.11	21.07	48.99	2.81	3.06	15.15	8.52	.29	.....
	Branch Lines:										
1910	First track	2,985.49	.....	24.86	263.98	.....	353.54	303.55	1,173.02	591.25	275.29
	Second track	14.90	.....	5.02	1.99	.....	.....	.....	7.89	.....	.....
	Total	3,000.39	.....	29.88	265.97	.....	353.54	303.55	1,180.91	591.25	275.29
	Per cent. of branch lines	.....	.....	1.00	8.86	.....	11.78	10.12	39.36	19.71	9.17
1909	First track	2,983.64	.....	.23	264.36	.....	341.38	293.12	1,187.84	619.54	277.17
	Second track	14.92	.....	.....	2.08	.....	4.93	.....	7.91	.....	.....
	Total	2,998.56	.....	.23	266.44	.....	346.31	293.12	1,195.75	619.54	277.17
	Per cent. of branch lines	.....	.....	.01	8.89	.....	11.55	9.77	39.88	20.66	9.24
1910	Total track	7,695.59	5.20	1,268.19	2,406.60	208.50	432.13	969.03	1,530.17	600.48	275.29
	Per cent. of total track	.....	.07	16.48	31.27	2.71	5.62	12.59	19.88	7.80	3.58
1909	Total track	7,621.60	5.20	974.15	2,531.38	129.69	487.64	993.64	1,589.81	632.92	277.17
	Per cent. of total track	.....	.07	12.78	33.21	1.70	6.40	13.04	20.86	8.30	3.64

BALLAST IN MAIN AND BRANCH LINES.

	Ballast	Total Miles Owned or Leased	Kind of Ballast and Miles of Each Kind: Rock	Burned Clay	Gravel	Cinder	Total	Sand or Dirt
	Main Lines:							
1910	First track	4,418.46	1,211.27	491.71	1,357.81	411.25	3,472.04	946.42
	Second track	267.31	16.10	.....	222.90	25.40	264.40	2.91
	Third track	9.43	.....	.....	9.43	.....	9.43	.....
	Total	4,695.20	1,227.37	491.71	1,590.14	436.65	3,745.87	949.33
	Per cent. of main lines	.....	26.14	10.47	33.87	9.30	79.78	20.22
1909	First track	4,348.59	1,104.94	460.51	1,363.84	370.30	3,299.59	1,049.00
	Second track	265.02	16.19	.....	217.00	29.05	262.24	2.78
	Third track	9.43	.....	.....	9.43	.....	9.43	.....
	Total	4,623.04	1,121.13	460.51	1,590.27	399.35	3,571.26	1,051.78
	Per cent of main lines	.....	24.25	9.96	34.40	8.64	77.25	22.75
	Branch Lines:							
1910	First track	2,985.49	118.95	30.83	625.11	271.31	1,046.20	1,939.29
	Second track	14.90	.....	.....	.....	14.90	14.90	.....
	Total	3,000.39	118.95	30.83	625.11	286.21	1,061.10	1,939.29
	Per cent. of branch lines	.....	3.96	1.03	20.83	9.54	35.36	64.64
1909	First track	2,983.64	105.13	16.08	624.62	290.66	1,036.49	1,947.15
	Second track	14.92	.....	.....	.65	14.27	14.92	.....
	Tctal	2,998.56	105.13	16.08	625.27	304.93	1,051.41	1,947.15
	Per cent. of branch lines	.....	3.50	.54	20.85	10.17	35.06	64.94
1910	Total track	7,695.59	1,346.32	522.54	2,215.25	722.86	4,806.97	2,888.62
	Per cent of total track	.....	17.49	6.79	28.79	9.39	62.46	37.54
1909	Total track	7,621.60	1,226.26	476.59	2,215.54	704.28	4,622.67	2,998.93
	Per cent. of total track	.....	16.09	6.25	29.07	9.24	60.65	39.35

INTEREST ACCRUED.
YEAR ENDED JUNE 30, 1910, COMPARED WITH PREVIOUS YEAR.

Description of Debt	Rate Per Cent.	Amount 1909-10	Amount 1908-09	Increase	Decrease
The Chicago, Rock Island and Pacific Railway Company:					
First and refunding mortgage gold bonds	4	$3,283,310.67	$2,934,520.00	$348,790.67	.....
First mortgage bonds	6	750,000.00	750,000.00	.....	.....
General mortgage gold bonds	4	2,463,240.00	2,463,240.00	.....	.....
Gold bonds of 1902	4	527,880.00	587,640.00	.....	$59,760.00
Extended two year notes, paid April 1, 1909	6	.....	270,000.00	.....	270,000.00
Equipment gold notes	4½	214,500.00	243,750.00	.....	29,250.00
Equipment notes, series B	6	25,500.00	32,464.47	.....	6,964.47
Equipment gold bonds, series C	4½	100,794.90	.....	100,794.90	.....
Equipment gold bonds, series D	4½	14,952.56	.....	14,952.56	.....
Miscellaneous interest	...	199,896.72	142,121.08	57,775.64	.....
Burlington, Cedar Rapids and Northern Railway Company:					
Consolidated first mortgage bonds	5	550,000.00	550,000.00	.....	.....
First mortgage bonds — Cedar Rapids, Iowa Falls and Northwestern Railway Company	5	95,250.00	95,250.00	.....	.....
First mortgage bonds—The Minneapolis & St. Louis Railroad Company	7	10,500.00	10,500.00	.....	.....
Rock Island and Peoria Railway Company:					
Consolidated first mortgage bonds	6	27,000.00	27,000.00	.....	.....
Choctaw, Oklahoma and Gulf Railroad Company:					
General mortgage bonds	5	275,000.00	275,000 00	.....	.....
First mortgage gold bonds—Choctaw and Memphis Railroad Company	5	176,224.76	176,250.00	.....	25.24
Consolidated mortgage gold bonds	5	270,550.00	270,550.00	.....	.....
First mortgage gold bonds—Little Rock Bridge Company	6	14,100.00	15,300.00	.....	1,200.00
Equipment trust notes, series B	5	.....	312.50	.....	312.50
Equipment trust notes, series C	4½	7,425.00	17,325.00	.....	9,900.00
Rock Island, Arkansas and Louisiana Railroad Company:					
First mortgage gold bonds	4½	123,750.00	.....	123,750.00	.....
Total interest		$9,129,874.61	$8,861,223.05	$268,651.56	.....

ROCK ISLAND LINES. PASSENGER TRAFFIC AND PER MILE OF ROAD STATISTICS.
Year Ended June 30, 1910, Compared with Previous Year.

	1909-10.	1908-09.	Increase.	Decrease.
Passenger Traffic:				
Revenue per passenger mile	$.0191	$.0188	$.0003	.....
Revenue per passenger	.962	.954	.006	.....
Revenue per train mile (excluding mail, express, etc.)	1.035	1.039	.....	.004
Revenue per train mile (including mail, express, etc.)	1.226	1.234	.....	.008
Revenue per car mile (cars carrying passengers)	.276	.266	.010	.....
Revenue per mile of road (exclud. mail, express, etc.)	2,409.14	2,228.08	181.06	.....
Revenue per mile of road (includ. mail, express, etc.)	2,869.56	2,651.14	218.42	.....
Number of passengers per train mile	54.31	55.34	.....	1.03
Number of passengers per car mile (cars carrying passengers)	14.46	14.14	.32	.....
Average distance carried (in miles)	50.47	50.83	.....	.36
Number of cars per train	5.10	5.16	.....	.06
Average miles of revenue passengers per mile operated.	126,360	118,695	7,666	.....
Per Mile of Road:				
Total operating revenue	$8,232.71	$7,622.97	$609.74	.....
Operating expenses	5,976.11	5,296.72	679.39	.....
Net operating revenue	$2,256.60	$2,326.25	.....	$69.65
Taxes	357.64	282.92	74.72	.....
Operating income	$1,898.96	$2,043.33	.....	$144.37
Outside operations (debit balance)	19.38	18.21	.....	1.17
Hire of equipment (debit balance)	145.59	101.18	.....	44.41
Other income	192.72	145.74	46.98	.....
Total income	$1,926.71	$2,069.68	.....	$142.07
Interest	1,135.05	1,104.01	31.04	.....
Rentals	192.38	195.35	.....	2.97
Betterments on lines leased from other companies*	9.01	2.07	6.94	.....
Total charges	$1,336.44	$1,301.43	$35.01	.....
Balance of income (available for dividends)	590.27	768.25	.....	177.98
Betterments on lines leased from other companies, per mile of the leased roads so improved†	393.88	89.96	303.92	.....

*Used average miles operated same as for other computations.

†Covers Keokuk and Des Moines Railway and Little Rock and Hot Springs Western Railroad.

ROCK ISLAND LINES. FREIGHT TRAFFIC STATISTICS.
YEAR ENDED JUNE 30, 1910, COMPARED WITH PREVIOUS YEAR.

	1909-10.	1908-09.	Increase.	Decrease.
Revenue per ton mile	$.0092	$.0094	.....	$.0002
Revenue per ton	2.203	2.284	.....	.081
Revenue per train mile	2.380	2.490	.....	.110
Revenue per car mile (excludes caboose car miles)	.0992	.1024	.....	.0032
Revenue per mile of road	5,248.76	4,878.67	370.09	.....
Number of tons per train mile—revenue freight	257.43	264.55	.....	7.12
Number of tons per train mile—company freight	39.51	36.19	3.32	.....
Number of tons per train mile—all freight	296.94	300.74	.....	3.80
Number of tons per loaded car mile—revenue freight	15.07	15.15	.....	.08
Number of tons per loaded car mile—company freight	2.31	2.07	.24	.....
Number of tons per loaded car mile—all freight	17.38	17.22	.16	.....
Number of cars per train—loaded	17.06	17.44	.....	.38
Number of cars per train—empty	6.89	6.84	.05	.....
Number of cars per train—all	23.95	24.28	.....	.33
Average haul per ton—revenue freight (in miles)	238.28	242.68	.....	4.40
Average haul per ton—company freight (in miles)	117.37	111.90	5.47	.....
Average haul per ton—all freight (in miles)	209.55	212.76	.....	3.21
Average ton miles of revenue freight per mile operated	567,792	518,394	49,398	.....

NORTHERN PACIFIC RAILWAY COMPANY—FOURTEENTH ANNUAL REPORT.

Office of the
NORTHERN PACIFIC RAILWAY COMPANY,
St. Paul, Minnesota,
September 23, 1910.

To the Stockholders of the
Northern Pacific Railway Company.

The following, being the Fourteenth Annual Report, shows the result of the operation of your property for the fiscal year ending June 30, 1910:

INCOME ACCOUNT.

Revenue From Transportation:

	1909.	1910.	Increase or Decrease.
Freight	$47,073,305.13	$48,758,736.25	$1,685,431.12
Passenger	17,330,608.06	21,333,312.84	4,002,704.78
Other revenue from transportation	3,416,101.72	3,671,816.80	255,715.08
Totals	$67,820,014.91	$73,763,865.89	$5,943,850.98
Revenue from operation other than transportation	640,732.30	761,960.30	121,228.00
Total operating revenue	$68,460,747.21	$74,525,826.19	$6,065,078.98
Per mile (average)	$12,071.46	$12,927.67	$856.21
Operating Expenses:			
Maintenance of way and structures	$7,847,050.35	$10,842,955.20	$2,995,904.85
Maintenance of equipment	7,845,689.35	8,992,137.09	1,146,447.74
Traffic expenses	919,199.03	1,036,403.62	117,204.59
Transportation expenses	20,305,621.20	24,045,197.09	3,739,575.89
General expenses	1,102,444.72	1,070,712.33	*$31,732.39
Totals	$38,020,004.65	$45,987,405.33	$7,967,400.68
Per mile (average)	$6,703.94	$7,977.24	$1,273.30
Net operating revenue	$30,440,742.56	$28,538,420.86	*$1,902,221.70
Per mile (average)	5,367.52	4,950.43	*417.09
Outside operations:			
Sleeping, parlor, observation, dining and cafe cars and restaurants	$429,359.58	$602,474.89	$173,115.31
Total net revenue	$30,870,102.14	$29,140,895.75	*$1,729,206.39
Taxes accrued	2,547,834.67	3,621,999.80	$1,074,165.13
Per mile (average)	449.25	628.29	179.04
Operating income	28,322,267.47	25,518,895.95	*2,803,371.52
Other income:			
Dividends and interest on securities, interest on deposits and miscellaneous.	2,355,670.81	2,506,474.91	150,804.10
Rentals received	889,748.10	1,289,252.04	399,503.94
Hire of equipment	452,218.91	160,578.51	*291,640.40
Gross income	$32,019,905.29	$29,475,201.41	*$2,544,703.88
Deduct:			
Rentals paid	$337,136.34	$509,927.90	$172,791.56
Interest on funded debt	6,775,002.50	6,669,014.17	*105,988.33
Interest and commissions on new stock subscriptions	3,268,416.36	.....	*3,268,416.36
Dividends on stock	14,105,000.00	17,360,000.00	3,255,000.00
Totals	$24,485,555.20	$24,538,942.07	$53,386.87
Net income for the year	$7,534,350.09	$4,936,259.34	*$2,598,090.75
Ratio of operating expenses to total operating revenue	55.54%	61.71%	6.17%
Ratio of taxes to total operating revenue	3.72%	4.86%	1.14%

*Decrease.

MILEAGE OPERATED.

Changes have taken place in the mileage operated during the year as follows:

There were added:

		Miles.
Jan. 31, 1910.	Shields River Valley Railway, Junction to Wilsall, Montana, constructed	22.90
Jan. 31, 1910.	Lewiston Junction to Lewiston, Idaho (Union Pacific R. R.), leased	72.03
Jan. 31, 1910.	Pasco to Snake River Junction, Wash. (Spokane, Portland & Seattle Ry.), leased	24.82
	Total additions	119.75
Deductions:		
Oct. 31. 1909.	Main line in Washington transferred to sidings	1.35
Jan. 31, 1910.	Red River Branch in Minnesota shortened.	.87
June 30, 1910.	Main Line in Oregon—North Portland to Goble—leased to Astoria & Columbia River R. R. Co.	35.15
June 30, 1910.	Corrections by line changes and rechaining	1.56
	Total deductions	38.93
	Net additions	80.82
	Mileage operated June 30, 1909	5,733.30
	Mileage operated June 30, 1910	5,814.12
	Average mileage operated during the year	5,764.83

EARNINGS.

FREIGHT BUSINESS.

Freight revenue was $48,758,736.25, an increase of $1,685,431.12, or 3.58 per cent., over the previous year.

5,419,084,365 tons of revenue freight were moved one mile, an increase of 158,591,705 tons one mile, or 3.01 per cent. over the previous year.

The rate per ton per mile increased from .00895 to .00900.

The revenue train load decreased from 434.59 to 429.28 tons. The total train load, including company freight, increased from 520.71 to 523.65 tons.

PASSENGER BUSINESS.

Passenger revenue was $21,333,312.84, an increase of $4,002,704.78, or 23.10 per cent., over the previous year.

Mail revenue was $1,032,891.12, a decrease of $30,165.78, or 2.84 per cent.

Express revenue was $1,573,000.11, an increase of $159,442.04, or 11.28 per cent.

Excess baggage and miscellaneous passenger revenue was $333,468.62, an increase of $22,984.67, or 7.40 per cent.

The total revenue for persons and property carried on passenger trains was $24,272,672.69, an increase of $4,154,965.71, or 20.65 per cent., over the previous year.

The number of passengers carried was 9,639,994, an increase of 1,235,282 over the previous year, and the number of passengers carried one mile was 976,772,093, an increase of 209,332,628, or 27.28 per cent.

The miles run by revenue passenger trains was 12,574,907, an increase of 3,003,475, or 31.38 per cent.

The rate per passenger per mile was .02184, and .02258 last year.

OPERATING EXPENSES.

CONDUCTING TRANSPORTATION.

The charges for transportation expenses were $24,045,197.09, an increase of $3,739,575.89, or 18.42 per cent., of which $1,973,532.66, or 9.72 per cent., consisted of labor.

Passenger train mileage for the year increased 31.38 per cent. over the previous year, which also necessarily entailed a large increase in transportation expenses.

MAINTENANCE OF EQUIPMENT.

The charges for maintenance of equipment were $8,992,137.09, an increase of $1,146,447.74, or 14.61 per cent.

LOCOMOTIVES.

Total number of locomotives on active list June 30, 1909		1,323
Additions:		
Purchased:		
Switch locomotives	25	
Pacific type passenger locomotives	44	
Mikado type freight locomotives	40	
Mallet type freight locomotives	11	
		120
		1,443
Deductions:		
Sold	8	
Dismantled	5	
		13
Total number on active list June 30, 1910		1,430
In addition to those on active list, there are 26 locomotives held for sale; four engines having been sold or dismantled during the year.		26
Total locomotives owned		1,456

HAULING CAPACITY.

Active list.	Number.	Tractive power.	Total weight on drivers.	Total weight of engine.
Assignment June 30, 1909	1,323	39,173,200	177,059,492	222,770,652
Added during fiscal year	120	4,869,700	21,873,550	28,743,500
Total	1,443	44,042,900	198,933,042	251,514,152
Sold and dismantled	13	243,500	1,074,500	1,350,650
Total	1,430	43,799,400	197,858,542	250,163,502

Note.—On account of several compound engines being changed to simple, the weights and tractive power for assignment as of June 30, 1909, do not show the same total as was shown in annual report for 1909.

The following statement shows the character and the condition of the locomotives of the company on June 30, 1910:

Wheel Arrangement.	Owned June 30, 1910.	Condemned Destroyed and Sold	Added.	Owned June 30, 1910.	Average Weight of Locomotive without tender. (Tons)		Average Tractive Force, Lbs.
					Total.	On Drivers.	
0-0	3	..	...	3	27.60	26.52	10,800
0-0-0	183	2	25	206	60.64	60.64	25,300
0-0-0-0	9	..	...	9	68.50	68.50	26,500
0-0-0-0a	142	3	...	139	53.38	44.34	18,155
0-0-0-0a	145	2	...	143	88.77	75.68	37,440
0-0-0-0-0a	2	.	..	2	72.51	65.27	34,800
0-0-0-0a	137	10	...	127	44.80	28.46	13,880
0-0-0-0a	292	..	...	292	79.36	59.48	26,115
0-0-0-0-0a	4	..	...	4	93.00	75.00	38,500
0-0-0-0a	6	..	...	6	84.39	43.85	21,550
0-0-0-0a	80	..	44	124	111.82	70.58	31,375
0-0-0-0a	150	..	...	150	102.25	76.75	33,300
0-0-0-0-0a	180	..	40	220	130.35	101.68	46,300
0-0-0-0-0a	16	..	6	22	170.70	150.72	64,940
0-0-0-0-0-0a	.....	..	5	5	218.98	201.90	89,540
Geared locomotives. .	4	..	...	4	63.32	63.32	29,250
Total	1,353	17	120	1,456	86.66	68.07	30,334

Condition.	Number.	Per cent.
Good	1,182	81.18
Fair	182	12.50
At shops	92	6.32
	1,456	100.00
Number of oil burning locomotives	3	0.206
Number of locomotives equipped with superheaters	81	5.56

PASSENGER EQUIPMENT.

On June 30, 1909, the company owned 1,005 passenger train cars, including 103 sleeping cars, owned jointly with the Pullman Company; one June 30, 1910, 1,119 passenger train cars, including 131 sleeping cars owned jointly with the Pullman Company, a net increase of 114.

The passenger equipment of the company was in extremely active use from July 1 to December 31, 1909, and could not be shopped during that time. On June 30, 1910, of the 1,119 cars owned, 894 cars were not due in shops for two months or more.

FREIGHT EQUIPMENT.

Comparative number and capacity of freight cars:

	1909		1910		Increase or decrease.	
	Number.	Capacity (tons).	Number.	Capacity (tons).	Number.	Capacity (tons).
Box	23,052	789,827	24,357	880,887	1,305	91,060
Furniture	428	10,800	638	19,770	210	8,970
Refrigerator	1,432	35,625	1,562	39,675	130	4,050
Stock	2,670	62,410	2,618	61,250	*52	*1,160
Flat	8,129	269,770	8,614	291,030	485	21,260
Oil	13	345	18	475	5	130
Coal	4,932	198,985	5,193	216,955	261	17,970
Ballast and ore	842	33,680	816	32,640	*26	*1,040
Totals	41,498	1,401,442	43,816	1,542,682	2,318	141,240
Percentage	....	....	....	....	5.59%	10.08%
Aver. capacity per car.	....	33.8	....	35.2	....	1.4

*Decrease.

Of the total number of freight cars on the road on June 30, 1910, only 1,744, or 3.98 per cent., were in need of repairs costing $5 per car or more.

In addition to equipment shown as on hand June 30, 1910, the following have been purchased during the current year and will be delivered this autumn:

Pacific type passenger locomotives		18
Passenger train cars:		
First-class coaches	9	
Dining cars	4	
Observation cars	11	
		— 24
Freight train cars:		
Box cars, 40 tons' capacity	33	
Refrigerator cars	71	
Gondolas, 50 tons' capacity	24	
Hart convertible ballast cars, 50 tons' capacity	348	
		— 476

DEPRECIATION OF EQUIPMENT.

In accordance with the rules of the Interstate Commerce Commission, the following amounts have been charged to operating expenses on account of estimated depreciation of equipment, viz.:

Locomotives	$820,121.34	
Passenger cars	236,899.51	
Freight cars	1,367,424.32	
Work cars	43,623.05	
Floating equipment	6,777.12	
		$2,474,845.34

MAINTENANCE OF WAY AND STRUCTURES.

The charges for maintenance of way and structures were $10,842,955.20, an increase of $2,995,904.85, or 38.18 per cent.

The table in the report of the Comptroller shows the distribution of this increase under the respective accounts.

The following statements give particulars of the work done and show that the property has been maintained and improved during the past year to such an extent that expenditures of equal magnitude will not be necessary during the current year.

PERMANENT WAY.

		1909.	1910.
New main line laid with 85-pound rail	miles	29.43	2.40
New second track laid with 85-pound rail	"	115.54	5.33
New second track laid with 90-pound rail	"	....	45.23
Main line relaid with new 90-pound rail	"	13.67	741.47
Branch line relaid with new 90-pound rail	"	....	9.00
Main line relaid with new 85-pound rail	"	374.18	31.16
Second track relaid with new 90-pound rail	"	19.00	36.06
Second track relaid with new 85-pound rail	"	5.34	....
Sidings and spurs constructed	"	130.77	75.86
Track ballasted	"	627.58	420.13
Embankment widened	"	191.70	370.00
Cross-tie renewals, main line	ties	1,306,170	1,509,404
Cross-tie renewals, branch lines	"	971,010	910,932
Timber bridges replaced by permanent structures and embankments, 173 in number, equal to	miles	1.65	5.75
Timber bridges renewed		44	40
Timber culverts replaced		217	101
New stock fence constructed	miles	272.57	159.84
New snow fence constructed	"	0.50	15.59

On June 30, 1910, 2,940.69 miles of important main lines of the company were laid with rail weighing 85 or 90 pounds to the yard. By the close of the calendar year 1910 all main line between St. Paul and Duluth, and between St. Paul, Duluth, Seattle and Portland, will have been laid with heavy steel, with the exception of the line between Brainerd and Staples, Minn., 30 miles, and a few points where changes in curvature and grade are contemplated.

BRIDGES.

During the year, 213 bridges were replaced and 114 abandoned. Forty were replaced by timber structures, and 22 permanent and 151 timber structures were replaced in permanent form, as follows:

Replaced by embankment	155	bridges,	28,823 lineal feet
Replaced by truss, girder and I-beam spans	18	"	1,550 " "
Total	173	"	30,373 " "

Forty timber bridges, making 8,117 lineal feet, have been renewed this year.

One hundred and one timber culverts were rebuilt this year—12 in temporary and 89 in permanent form.

On June 30 there were under construction on operated lines 1,255 lineal feet of steel girder and I-beam spans, 1,866 lineal feet of steel truss spans, 259 lineal feet of steel trestle, 896 lineal feet of reinforced concrete trestle, one 325-foot and one 200-foot steel draw spans and one 160-foot bascule draw span.

BRIDGES AS THEY EXISTED JUNE 30, 1910.

	No.	Aggregate length. Lineal ft.	Miles.
Steel, iron, stone and concrete permanent bridges	522	86,698	16.42
Timber and combination iron and timber structures	2,657	427,995	81.06
Totals	3,179	514,693	97.48

Total length of timber structures replaced by steel bridges, embankment, or in other permanent form, from July 1, 1885, when work was commenced, to June 30, 1910, has been 118.21 miles.

BLOCK SIGNALS AND INTERLOCKING PLANTS.

On account of the growing volume of business moving over the important main lines of your company, safety appliances of one kind and another have been authorized, as follows:

Minnesota—
- Between Northtown Junction and St. Cloud—Automatic, electric block signals for double track.
- St. Cloud—Electric interlocking plant for crossing with the Great Northern Railway.
- Manitoba Junction—Interlocking plant to protect the junction of the Winnipeg line with the main line.
- Staples to Dilworth—Automatic, electric block signals for double track.
- Carman—Mechanical interlocking plant for crossing with the Great Northern Railway.

Wisconsin—
- Superior—Mechanical interlocking plant for crossing of this company's line with the Minneapolis, St. Paul & Sault Ste. Marie Railway.

Montana—
- Huntley and Billings—Automatic signals for protection of the Yellowstone River bridge.
- Laurel—Mechanical interlocking plant for the protection of the yard and the connection with the Great Northern Railway.
- Billings to Livingston—Automatic, electric block signals.
- Livingston—Automatic signals protecting the junction of the main line with the Yellowstone Park Branch.
- Silver Bow—Mechanical interlocking plant to protect crossing with the Butte, Anaconda & Pacific Railway.
- Garrison—Mechanical interlocking plant to protect junction of the Helena and Butte lines.
- Garrison to Missoula—Automatic, electric block signals.

Washington—
- Tacoma-Seattle—The block signals mentioned in the last report have been installed and placed in service.
- Kalama to Vancouver—Contract has been let for installation of electric block signals.

Oregon—
- North Portland to Portland—Contract has been let for installation of electric block signals.
- Contract also has been let for suitable signals on the double track bridges over the Columbia and Willamette rivers and approaches to and connection between them.

CHARGES TO CAPITAL ACCOUNT.

Upon requisition of the executive officers, approved by the Board of Directors, expenditures have been made during the past fiscal year for:

Real estate, right of way and terminals:		
At Superior, Wis., real estate	$1,269.14	
St. Paul, Minn., real estate	10,376.00	
Minneapolis, Minn., real estate	58,251.35	
Laurel, Mont., terminals	9,486.72	
Paradise, Mont., terminals	30,465.70	
Sand Point, Idaho, terminals	14,946.69	
Spokane, Wash., real estate	1,327.80	
Seattle, Wash., terminals, tunnel and passenger station	13,434.37	
Tacoma, Wash., real estate (credit)	*72.95*	
Aberdeen, Wash., real estate	1,859.00	
		$141,343.82
Branches, line changes, grade revisions and second main track:		
One-third interest in double track line Vancouver to North Portland, including bridges over Columbia and Willamette rivers (two-thirds owned by Spokane, Portland & Seattle Railway Co.)—additional charges	$70,720.95	
Edgeley-Missouri River line, North Dakota	38,284.66	
Pingree west line, North Dakota	143,891.68	
Turtle Lake extension, North Dakota	21,399.87	
Glendive-Helena cut-off, Montana	22,883.98	
Bitter Root Branch extension, Montana	12,364.41	
DeSmet to Paradise, Montana (credit)	*573.90*	
White Pine Hill, Mont., grade revision	38,076.38	
Ritzville-Ellensburg cut-off, Washington, right of way	72,204.60	
Sunnyside Branch extension, Washington	65,209.05	

Green River Branch extension, Washington..	$10,832.12	
Tacoma-Tenino line, Washington	884,091.84	
Gray's Harbor & Columbia River Railway	32,840.43	
Surveys and right of way—North Dakota and Montana	3,512.04	
Argo to Black River, Washington, right of way for additional main track	12,635.35	
Rights of way at Seattle, Wash., for change of line and new tracks	99,907.11	
Superior to Central Ave., Wis., second main track	433.54	
St. Cloud to Rice's, Minn., second main track	76,218.95	
Philbrook to Staples, Minn., second main track.	21,529.76	
Wadena to Lake Park, Minn., second main track	96.00	
Lake Park to Glyndon, Minn., second main track (credit)	*24,000.99*	
Wheatland to Buffalo, N. D., second main track	45,213.57	
Alta to Berea, N. D., second main track (credit)	*1,985.62*	
Bloom to Jamestown, N. D., second main track	14,135.88	
Huntley to Billings, Mont., second main track	141,377.73	
Billings to Laurel, Mont., second main track.	165,984.29	
Livingston to Muir, Mont., second main track (credit)	*42,261.16*	
West End Junction to Muir, Mont., second main track	6,330.48	
Bozeman to Logan, Mont., second main track	76,498.18	
Garrison to Missoula, Mont., second main track	289,053.18	
Missoula to DeSmet, Mont., second main track	7,958.38	
M. P. 73 to Yardley (Spokane), Wash., second main track	453.10	
Auburn to Meeker, Wash., second main track	1,746.85	
Tenino to Kalama, Wash., grade revision and double track	2,075,359.39	
Kalama to Vancouver, Wash., second main track	271,550.25	
North Portland to Portland city limits, Oregon, second main track	49,745.13	
		4,702,717.46
Additions and betterments:		
Right of way and station grounds	$104,056.85	
Widening cuts and fills	35,360.59	
Protection of banks	45,091.47	
Grade revisions and change of line	51,185.81	
Tunnel improvements	246.45	
Bridges, trestles and culverts	195,244.72	
Increased weight of rail	791,386.92	
Improved frogs and switches	27,076.22	
Track fastenings and other material	214,611.55	
Ballast	196,546.67	
Additional main tracks	37,352.04	
Sidings and spur tracks	292,418.25	
Terminal yards	162,619.26	
Fencing right of way	33,292.13	
Improvements of over and under grade crossings	6,460.00	
Track elevation, elimination of grade crossings, etc.	54,754.29	
Interlocking apparatus	35,619.62	
Block and other signal apparatus	121,516.41	
Telegraph and telephone lines	62,599.30	
Station buildings and fixtures	513,220.36	
Shops, engine houses and turntables	171,932.15	
Shop machinery and tools	5,634.91	
Water and fuel stations	166,832.90	
Dock and wharf property	213,338.03	
Snow and sand fences and snow sheds	4,978.78	
Miscellaneous structures	50,946.46	
		3,594,322.14

New equipment.	Total expenditure.	Less used from reserves.	Charged capital.	
Locomotives	$2,340,646.86	$80,189.09	$2,260,457.77	
Passenger train cars	1,284,959.57	93,218.92	1,191,740.65	
Freight train cars and work cars..	3,381,554.44	964,874.18	2,416,680.26	
	$7,007,160.87	$1,138,282.19		5,868,878.68
Total for the year				$14,307,262.10

In addition to the above amount added to the cost of the Northern Pacific Estate, advances have been made to sundry companies as follows:

Spokane, Portland & Seattle Railway Co	$930,000.00
Clearwater Short Line Railway Co	454,114.52
Missouri River Railway Co	3,952,058.09
Western Dakota Railway Co	1,659,254.80
Shields River Valley Railway Co	394,240.75
Connell Northern Railway Co	1,477,397.16
Olympic Peninsular Railway Co	35,131.37
Kennewick Northern Railway Co	12,852.03
Bear Creek & Western Railway Co	18,483.20
Midland Railway of Manitoba	1,142,500.00
*Big Fork & International Falls Railway Co. (credit)	*735,674.24*
Advances for railway development in Oregon	5,000,000.00
Total	$14,340,357.68

*A note having been given for this item, it has been transferred to "Other Investments," in accordance with rules of Interstate Commerce Commission.

CAPITAL STOCK AND DEBT.

There has been no change in the amount of capital stock outstanding during the year, viz. $248,000,000.00

The only change in bonded debt during the year was the cancellation of prior lien bonds purchased with net moneys of the Land Department, as provided by Article 8, Section 2, of mortgage, amounting to $485,000.00

CAMAS PRAIRIE RAILWAY COMPANY.

For simplicity in operation, an operating company was organized to maintain and operate the railroad owned partly by the Northern Pacific and partly by the Union Pacific Railroad Company between Grangeville, Idaho, on the fertile plateau back of Lewiston, and Riparia (Lewiston Junction), Wash., via Lewiston, 148.8 miles. At Lewiston Junction connection is made with the Portland line of the Oregon Railway & Navigation Company and with the Snake River line of the Northern Pacific to Snake River Junction and the Spokane, Portland & Seattle Railway to Pasco, thus forming a line of communication between the Camas Prairie, Lewiston, the Clearwater Valley, the Yakima Valley, Puget Sound and Portland.

The new company has operated the roads since December 1, 1909. The earnings on through business are retained by the owning company handling the same; the earnings on local business are applied to the maintenance and operation of the joint lines.

SPOKANE, PORTLAND & SEATTLE RAILWAY COMPANY.

The total miles operated by this company for the year ending June 30 were:

Spokane, Portland & Seattle Railway:	Owned.	Leased.	Total.
Spokane, Wash., to Portland, Ore	371.95	16.85	388.80
Lyle to Goldendale, Wash	42.25	....	42.25
Total	414.20	16.85	431.05
Astoria & Columbia River R. R.:			
Portland to Astoria, Ore	60.30	35.15	95.45
Astoria to Seaside, Ore	22.80	....	22.80
Total	83.10	35.15	118.25
Grand total	497.30	52.00	549.30

The results of the operation of the Spokane, Portland & Seattle and Astoria & Columbia River roads for the year ending June 30, 1910, were:

	Spokane, Portland & Seattle Railway.	Astoria & Columbia River Railroad.	Total both companies.
Operating revenue	$3,566,291.45	$767,987.39	$4,334,278.84
Operating expenses	2,386,962.08	468,361.77	2,855,323.85
Net operating revenue	$1,179,329.37	$299,625.62	$1,478,954.99
Outside operations	*3,970.30	12,541.01	8,570.71
Total net revenue	$1,175,359.07	$312,166.63	$1,487,525.70
Less taxes	294,675.04	32,955.83	327,630.87
Operating income	$880,684.03	$279,210.80	$1,159,894.83
Other income (rents, etc.) rec'd..	381,523.18	1,767.82	383,291.00
Gross income	$1,262,207.21	$280,978.62	$1,543,185.83
Rents, hire of equipment, etc.	329,793.98	58,878.75	388,672.73
Balance	$932,413.23	$222,099.87	$1,154,513.10

*Deficit.

Business of the Northern Pacific Railway between Spokane and points east thereof and the Gray's Harbor territory in the State of Washington and points south therefrom, including Portland, and business handled via Portland, is now commonly routed via the Spkoane, Portland & Seattle Railway.

The gross earnings of that railway on business exchanged with the Northern Pacific in the year covered by this report approximated $1,900,000.00.

During the year attention has has been given to the development of business in Oregon. The Oregon Trunk Railway Company is now building a line of road from a point near Clarke, Washington, on the Spokane, Portland & Seattle Railway, southwardly across the Columbia River and up the Des Chutes Valley to Bend, Oregon, a distance of 156 miles. This road will furnish communication between the great central plateau of Oregon and the outside world.

The capital stock of the Oregon Railway Company, which owns valuable rights and terminals in Portland, and completed lines south and west of Portland to Salem, Hillsboro and Cornelius, and of the United Railways Company, which has valuable terminals and rights in and about Portland, and a line partly completed into the counties of Columbia, Clatsop and Tillamook, have been acquired.

These three enterprises, in connection with the Spokane, Portland & Seattle Railway, will enable your company to participate in the business of Central Oregon and south and west of Portland.

The construction and management of the properties are being handled by the Spokane, Portland & Seattle Railway Company, and your company, up to June 30, had advanced as its share of the investment $5,000,000.00, shown in the statement of Construction Expenditures as "Advances For Railway Development in Oregon."

NEW LINES, DOUBLE TRACK, GRADE REVISIONS AND LINE CHANGES.

MINNESOTA.

Lake Park to Glyndon, Second Main Track, 26.83 *miles.*

This work has been completed, except for a sink hole near Stockwood. Until the embankment completely settles it is not expected to do any more work on this part of the grade. Double-track is now in operation for the whole distance; one mile at Stockwood is not on final grade.

Saint Cloud to Rice's, Second Main Track, Line and Grade Change, 14.79 *miles.*

Grading on this work will be finished by autumn, and a part of the track will be laid, the balance of the work being postponed until 1911.

Philbrook to Staples, Second Main Track with Slight Grade Revisions, 6.3 *miles.*

This work will be fully completed and ready for operation November 1st except for one bridge, which will remain as single track until 1911.

NORTH DAKOTA.

Bloom to Jamestown, Second Main Track, 4.99 *miles.*

Grading for this track is completed, and some of the rail laid, but the work will not be finished until 1911.

(When these three pieces of work are finished the Company will have double track between Saint Paul and Jamestown equal to 258.65 miles out of a total of 345.2 miles.)

Pingree to Wilton, 92.5 *miles.*

The grading for this piece of road is making good progress, and will be completed this autumn. No track or bridge material will be put in place during 1910.

Missouri River Railway (Mandan North Line), 53 *miles.*

Grading is completed, except for some small slides and some deep cuts where no track is laid. 28 miles of main track have been laid from Mandan north to Sanger. Completion of this line has been postponed until 1911.

Missouri River Railway (Mandan South Line), 72 *miles.*

Grading on this line is practically completed and track has been laid from Mandan south to mile post 42. No track will be laid beyond that point for the present.

Western Dakota Railway (Cannon Ball Line), to Mott, 90 miles.
Grading and track will be completed into Mott by October 15th.

MONTANA.

Glendive East Line, from Glendive northeastwardly along the Yellowstone River, 55 miles.

Grading has been completed and piers for abutments of bridge across Yellowstone River will be finished before bad weather. The bridge will not be put up, nor will the track be laid, until 1911.

Huntley to Billings, Second Main Track, Line and Grade Changes, 12.63 miles.

Grading is completed, and 8 miles of track will be completed and ready for operation late this autumn, the balance of the work being postponed until 1911.

Billings to Laurel, 15.36 miles.
This work is all finished and track in use.

Shields River Valley Railway, 23 miles.
This line has been completed, is in operation, and the valley is developing rapidly.

Missoula to De Smet, Second Main Track, 7.02 miles.
This work will be completed by December 15th.

Bitter Root Extension, 2.76 miles.
All the work to be done in 1910 on this track is completed.

WASHINGTON.

Spokane to Wins, Second Main Track, 4.4 miles.
This work will be completed this autumn.

Wins to Marshall, Second Main Track, 2.38 miles.
This work has been completed and track in operation.

Connell Northern Railway, Connell to Adrian, 62 miles.
Grading and track laying have been completed, but it is not expected to begin operating this road until 1911.

Ritzville Branch, 38 miles.
Grading has been completed on this line, and part of the track will be laid this autumn.

Point Defiance Line between Tacoma and Tenino.
Careful investigation is being made of the character of the material along this line, but work will not be begun until 1911.

Tenino to Vancouver, Second Main Track and Grade Changes.
This work is being done in order to provide double-track main line with low curvature and low grades for joint use of Northern Pacific, Great Northern, and Union Pacific roads. Grading, bridging and track laying have been completed and line is operated as double-track between Tenino and Chehalis, 14.5 miles; grading between Chehalis and Kalama will be completed by or before November 15th, and considerable of the track and bridge work will be finished. The balance of the work will have to go over until 1911.

Kalama to Vancouver, 28.5 miles.
Double-track has been completed on new line and grade and is now being operated.

OREGON.

North Portland to Portland, Second Main Track, 3.26 miles.
Work is completed and track now in operation.

GENERAL.

The fiscal year just ended started with very great business activity in the territory served by your company's lines. The Alaska-Yukon-Pacific Exposition was held in Seattle from June 1st to October 16th, 1909, inducing a very large passenger movement. The Flathead, Coeur d'Alene and Spokane Indian Reservations were opened during the year and the period of registration extended from July 15th, 1909, to August 5th, 1909. This created a large amount of passenger business, and there was a very general demand for land all through the country, resulting in a large volume of travel. The crops harvested in the autumn of 1909 were all of fair volume, and your company's earnings for the first five months of the fiscal year, to November 30th, were $35,681,803.48, or at the rate of over $7,000,000.00 a month, the gross earnings in October reaching the figure of $7,793,072.82.

In August in the Red River Valley, and in the latter part of November and early in December in the far West, particularly in Western Washington, serious floods came at various points doing much damage and causing considerable interruption to the free movement of business.

On November 30, the switchmen, who were members of the Switchmen's Union of North America, left their positions after refusing to submit their demands to arbitration. At the same time an unusually heavy and severe winter set in and the operation of your road from December 1 to March 31 was unsatisfactory and expensive.

The effects of the Chicago, Milwaukee & Puget Sound line; of the making of connection between the Chicago, Burlington & Quincy Railroad, and the Great Northern Railway at Billings; of the Spokane, Portland & Seattle Railway between Portland and Spokane; and of the Minneapolis, St. Paul & Sault Ste. Marie line to Duluth were experienced during the year. Notwithstanding this new competition the fact that the gross freight earnings of your Company increased is a gratifying indication of the growth of the country tributary to its lines.

Attention is directed to the increase in taxes from $2,547,834.67 paid in the year ending June 30, 1909, to $3,621,999,80 for the year ending June 30, 1910, an increase of $1,074,165.13, or 42%. The increase per mile is from $449.25 for 1909 to $628.29 for 1910. This class of expenditure is beyond the control of the Company. The Corporation Income Tax, amounting to $201,196.75, assessed by the United States Government under Section 38, Act of Congress approved August 5, 1909, has been paid under protest.

In the course of the year, arrangements were concluded with the Union Pacific system and the Great Northern system, respectively, whereby, for certain rentals payable to this Company, the Union Pacific and the Great Northern were granted the right of joint use and occupation of this Company's main line of railway, and appurtenances, between Tacoma and Vancouver, Washington. The Great Northern was also granted similar rights on this Company's main line between Seattle and Tacoma.

The rights of the Union Pacific also extend to use of the bridge over the Columbia River, owned, two-thirds by the Spokane, Portland & Seattle Railway Company, and one-third by this Company.

The rights of the Great Northern also extend over the said bridge, and over the Willamette River bridge, and tracks similarly owned, and over tracks owned solely by this Company, into Portland.

It is believed that these arrangements, which are to be practically permanent, will prove advantageous to all the parties and to the public.

The work of re-adjusting the Tacoma terminal, and of revising grades, and double-tracking the line between Tacoma and Vancouver, necessitated by the above arrangements, is advancing as rapidly as practicable.

The Union Pacific began operating under this arrangement on January 1, 1910.

The Great Northern used this Company's property between Tacoma and Seattle during the entire business year, and, on June 19, 1910, began running trains between Tacoma and Portland

On May 4, 1908, Ex-Judge Charles E. Otis was appointed by Honorable Walter H. Sanborn, Judge of the Circuit Court of the United States, a Special Master in Chancery in the suit of certain stockholders of your Company against the Company; against officers of the State; and against shippers; to enjoin the Company's observance of freight rates on commodities ordinarily handled in car load lots, and on other articles, both car loads and less, embraced in the usual freight classifications; and of a rate of two cents a mile for passengers; the rates covering substantially all the business of the Company handled within the State of Minnesota.

The Special Master was appointed with "power and direction to take and report to the Court the evidence, to examine such evidence, make all necessary computations, find and state the facts so found and the results of such computations, and recommend to the Court a form of a proper decree."

The case has been tried most thoroughly and exhaustively, and many expert witnesses have testified on behalf of the stockholders and of the State, and most elaborate statements of valuations, earnings, expenses and accounts have been submitted. The testimony in the case consists of 4,258 pages, and the special statements supplementary thereto fill two volumes.

On September 21, 1910, the Master submitted his findings and recommendations. He finds that the property of the Company employed in its transportation business was worth June 30, 1908, $452,666,489.00. This valuation does not include any of the following properties:

The Spokane, Portland & Seattle Railway Company and controlled companies.
The Minnesota & International Railway.
The Big Fork & International Falls Railway.
The railways recently constructed in the Clearwater Valley and on the Camas Prairie above Lewiston.
The lines now under construction in Western North Dakota.
The lines now under construction in Montana.
The Canadian property of the Company leased to the Government of Manitoba.
The land grant of the Company and land grant assets.
The Northwestern Improvement Company—owning coal mines, lands and other property.
Terminals owned in Winnipeg.
The treasury securities of the Company.

The Master finds that two State laws, one fixing rates on commodities in car loads, the other a two-cent passenger rate, and the order of the State Railroad Commission fixing class rates, are all confiscatory and therefore void. He also holds the two laws and the order void as being direct interference with interstate rates and commerce. He recommends to the United States Circuit Court a form of decree enjoining the officers of the State from enforcing the two laws and the order of the Commission, and enjoining the Railway Company from continuing to comply with the same.

The case, it is hoped, will reach the United States Circuit Court prior to December 31, 1910.

The report of the Comptroller gives further details of the transactions of the Company.

By order of the Board of Directors,

HOWARD ELLIOTT,
President.

INCOME ACCOUNT

FOR THE FISCAL YEAR ENDING JUNE 30, 1910.

Dr. To			*Cr.* By		
Operating Expenses:			Operating Revenues:		
Maintenance of way and structures	$10,842,955.20		Freight	$48,758,736.25	
Maintenance of equipment	8,992,137.09		Passenger	21,333,312.84	
Traffic expenses	1,036,403.62		Other	4,433,777.10	
Transportation expenses	24,045,197.09				$74,525,826.19
General expenses	1,070,712.33		Outside Operations:		
		$45,987,405.33	Sleeping cars	$529,847.16	
Taxes:			Parlor and observation cars	59,268.16	
State and county	$3,420,803.05		Dining and cafe cars (Deficit)	104,869.18	
U. S. Government Income Tax	201,196.75		Restaurants	118,228.75	
		$ 3,621,999.80			602,474.89
Interest and Rentals:			Rentals Received		1,289,252.04
Interest on funded debt	$6,669,014.17		Hire of Equipment		160,578.51
Rentals of leased roads and terminals	504,649.26		Miscellaneous Income		13,340.65
Other rentals	5,278.64		Dividends and Interest on securities owned and interest on deposits		2,493,134.26
		$ 7,178,942.07			
Dividends:					
Nos. 48, 49, 50 and 51		17,360,000.00			
Balance carried to credit of Profit and Loss below		4,936,259.34			
		$79,084,606.54			$79,084,606.54

NORTHERN PACIFIC RAILWAY COMPANY.

GENERAL BALANCE SHEET, JUNE 30, 1910.

ROAD AND EQUIPMENT (Northern Pacific Estate):		
Cost to June 30, 1907—Road, lands, etc.	$318,388,493.45	
Equipment	37,295,670.07	
		$355,684,163.52
Cost since June 30, 1907—Road	$35,078,145.73	
Equipment	10,175,447.75	
Land Department current assets	3,909,073.56	
		49,162,667.04
		$404,846,830.56
Less reserve for accrued depreciation	7,798,145.70	
		$397,048,684.86
SECURITIES:		
Securities of proprietary, affiliated and controlled companies—pledged, viz.: This company's one-half of $107,613,500 stock of Chicago, Burlington & Quincy Railroad Company pledged to secure payment of $215,227,000 joint bonds made and issued by this Company and the Great Northern Railway Company to pay for said stock, costing	$109,114,809.76	
Other pledged securities	1,256,160.74	
	$110,370,979.50	
Securities of proprietary, affiliated and controlled companies—unpledged	2,905,330.94	
		113,276,301.44
OTHER INVESTMENTS:		
Advances to proprietary, affiliated and controlled companies for construction, equipment and betterments	$52,127,788.32	
Miscellaneous investments, securities—unpledged	4,296,991.52	
		56,424,779.84
Total Capital Assets		$566,749,766.14
WORKING ASSETS:		
Cash	$8,397,347.72	
Securities issued or assumed—held in treasury	20,041,000.00	
Marketable securities (other than those issued or assumed)	19,039,968.04	
Loans and bills receivable	31,357.56	
Traffic and car service balances due from other companies	1,178,421.82	
Net balances due from agents and conductors	806,585.06	
Miscellaneous accounts receivable	6,058,734.97	
Material and supplies	9,077,900.68	
		64,631,315.85
ACCRUED INCOME NOT DUE:		
Unmatured interest, dividends and rents receivable		1,399,339.30
DEFERRED DEBT ITEMS:		
Advances	$86,121.83	
Special deposits (with trustees of mortgages)	2,594,906.78	
Cash and securities in Sinking and Redemption Funds	195,921.70	
Cash and securities in Insurance Fund	5,395,891.52	
		8,272,841.83
		$641,053,263.12

CAPITAL STOCK: Common		$248,000,000.00
MORTGAGE, BONDED AND SECURED DEBT:		
Mortgage bonds	$190,952,500.00	
Collateral Trust bonds (Northern Pacific-Great Northern joint) total issue	$215,227,000.00	
Less Great Northern Railway Company's proportion	107,613,500.00	
	107,613,500.00	
		298,566,000.00
Total Capital Liabilities		$546,566,000.00
WORKING LIABILITIES:		
Traffic and car service balances due to other companies	$784,079.28	
Audited vouchers and wages unpaid	8,501,797.47	
Miscellaneous accounts payable	19,974.82	
Matured interest, dividends and rents unpaid	1,108,574.00	
Other working liabilities	665,205.41	
		11,079,630.98
ACCRUED LIABILITIES NOT DUE:		
Unmatured interest, dividends and rents payable	$4,853,908.44	
Taxes accrued (partly estimated)	1,765,988.45	
		6,619,896.89
DEFERRED CREDIT ITEMS:		
Other deferred credit items		141,880.97
APPROPRIATED SURPLUS:		
Invested in other reserve funds (Insurance Fund)	$5,395,891.52	
Not specifically invested	83,552.23	
		5,479,443.75
PROFIT AND LOSS		71,166,410.53
		$641,053,263.12

Note.—This Balance Sheet has been made in accordance with the Form prescribed by the Interstate Commerce Commission as of June 15, 1910. It varies considerably in the grouping and arrangement of accounts from the General Balance Sheets heretofore published by this company.

PROFIT AND LOSS ACCOUNT. JUNE 30, 1910.

To		By	
Balance of discount on prepayment of subscriptions to new capital stock	$73,563.03	Balance to credit June 30, 1909, as per annual report	$58,172,008.07
Balance	71,166,410.53	Balance of Income for year ending June 30, 1910, brought down	4,936,259.34
		Balance of sundry reserve accounts	6,189,900.33
		Balance of sundry accounts written off	25,091.53
		For difference between par value and book value of securities issued or assumed by this company and held in treasury	*1,919,714.29
	$71,239,973.56		$71,239,973.56
		By Balance to credit of Profit and Loss as per balance sheet	$71,166,410.53

*Taken to credit in compliance with rules of Interstate Commerce Commission.

MORTGAGE DEBT, JUNE, 30, 1910.

(Exclusive of the Northern Pacific-Great Northern Joint Bonds Outstanding.)

Name.	Amount outstanding.	Date.	Matures.	Interest—Rate.	Interest—When payable.	Amount charged income for fiscal year.*
Issued.						
Northern Pacific Ry. Co. prior lien mortgage	$107,521,500.00	1897	1997	4%	Jan., April, July, Oct.	$4,065,680.00
Northern Pacific Ry. Co. general lien mortgage	60,000,000.00	1897	2047	3%	Feb., May, Aug., Nov.	1,569,717.50
Northern Pacific Ry. Co., St. Paul-Duluth Division mortgage	8,080,000.00	1900	1996	4%	June, Dec.	319,156.67
Assumed.						
St. Paul & Northern Pacific Ry. mortgage	8,021,000.00	1883	1923	6%	Feb., Aug.†	481,260.00
St. Paul & Duluth R. R. first mortgage	1,000,000.00	1881	1931	5%	Feb., Aug.	50,000.00
St. Paul & Duluth R. R. second mortgage	2,000,000.00	1887	1917	5%	April, Oct.	100,000.00
St. Paul & Duluth R. R. first consolidated mortgage	1,000,000.00	1898	1968	4%	June, Dec.	40,000.00
St. Paul & Duluth R. R. Taylor's Falls & Lake Superior mort.	210,000.00	1884	1914	6%	Jan., July	12,600.00
St. Paul & Duluth R. R., Duluth Short Line mortgage	500,000.00	1886	1916	5%	March, Sept.	25,000.00
Washington & Columbia River Ry. first mortgage	2,620,000.00	1895	1935	4%	Jan., July	5,600.00
Total	$190,952,500.00					$6,669,014.17

*Interest on bonds in treasury not included above, viz.: Prior Lien bonds, $6,110,000.00; General Lien bonds, $7,760,000.00; Washington & Columbia River Railway bonds, $2,480,000.00.

†Registered interest, payable quarterly.